CHEMICAL INDUSTRIES

PHENOTHIOXIN

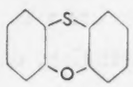
. . RESEARCH SAMPLES NOW AVAILABLE

Phenothioxin: The Dow *Special Product* described here is now available for research purposes. Dow encourages your interest in this product with the hope that it will prove valuable to you in future developmental work.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

New York, St. Louis, Chicago, San Francisco, Los Angeles, Seattle, Houston

PHENOTHIOXIN



Properties:

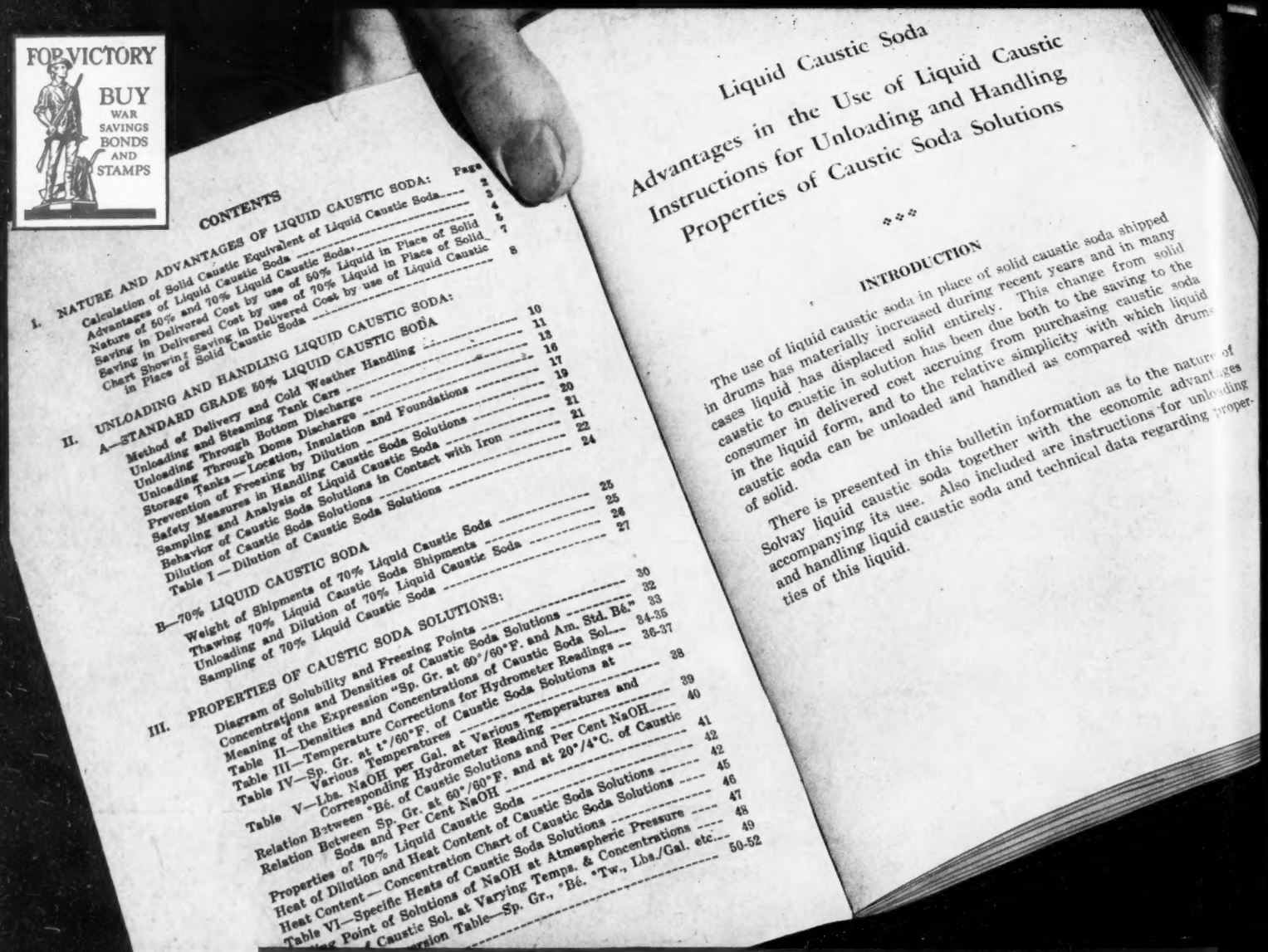
White crystalline solid with a faint pleasant odor.

Boiling Point at 10 mm. Hg	180° C.
Specific Gravity at 60/25° C.	1.226
Pounds per Gallon at 60° C.	10.4
Melting Point	53-55° C.
Flash Point	162° C.
Fire Point	188° C.

Solubility:
(*grams per 100 grams solvent*)

Acetone at 25° C.	200
Benzene at 25° C.	165
Carbon Tetrachloride at 25° C.	100
Ether at 25° C.	165
Methanol at 25° C.	7
Water at 80° C.	Insoluble
V. M. P. Naphtha at 25° C.	35

DOW *Special* PRODUCTS — CHEMICALS INDISPENSABLE



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Liquid Caustic Soda

Advantages in the Use of Liquid Caustic
Instructions for Unloading and Handling
Properties of Caustic Soda Solutions

***

INTRODUCTION

The use of liquid caustic soda in place of solid caustic soda shipped in drums has materially increased during recent years and in many cases liquid has displaced solid entirely. This change from solid caustic to caustic in solution has been due both to the saving to the consumer in delivered cost accruing from purchasing caustic soda in the liquid form, and to the relative simplicity with which liquid caustic soda can be unloaded and handled as compared with drums of solid.

There is presented in this bulletin information as to the nature of Solvay liquid caustic soda together with the economic advantages accompanying its use. Also included are instructions for unloading and handling liquid caustic soda and technical data regarding properties of this liquid.

BOOK OF THE YEAR

...To The Man Who Needs Down-to-Earth Information On Handling Caustic Soda!

If you are a technician or plant operator who is now "taking over" an assignment which necessitates a more specific knowledge of Caustic Soda than you previously required, *then write today for Solvay Technical Service Bulletin No. 6.*

This bulletin contains time-saving, factual information from which all sales talk has been eliminated It is full of important tables, charts and other data on the handling of Caustic Soda. It is information which goes straight to the point... helps you improve efficiency, reduce man hours and increase production speed.

Solvay Technical Service Bulletin No. 6 on Liquid Caustic Soda is one of the series of Solvay Bulletins which are constantly being revised on the basis of new findings. For years this technical literature has had the recognition of plant operators, engineers and scholars who realize that such vital operations data concerning alkalies can only originate out of the breadth of accumulated experience Solvay has gained as America's oldest and largest manufacturer of alkalies.

If you don't use Caustic Soda, then send for any of the OTHER SOLVAY BULLETINS listed below, which pertain to your work.

SOLVAY SALES CORPORATION

Alkalies and Chemical Products Manufactured by The Solvay Process Company

40 RECTOR STREET NEW YORK, N. Y.

BRANCH SALES OFFICES:

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Use and handling of Caustic Soda • Analysis of Alkalies • Soda Ash Handling • Alkalies and Chlorine in Water Treatment • Analysis of Li
Chlorine and Bleach • Water Analysis • Calcium Chloride in Refrigeration • Road Surface Stabilization • Analysis of Calcium Chloride and Limes

Resins and the War

RESINS are important in the War effort, therefore our research has been successfully directed towards the manufacture of S & W Resins that meet the specifications set up by the Government agencies. Where critical raw materials are involved, we are delivering resins against the proper preference ratings, and whenever possible are maintaining stocks in the large production centers throughout the country so that they are available to manufacturers without delay.

We anticipate having, as before, for use in the production of essential civilian finishes, limited quantities of certain resins that do not require critical raw materials.

THE COMPLETE RESIN LINE

"S & W" ESTER GUM—all types
"AROFENE"*—pure phenolics
"AROCHEM"*—modified types
"CONGO GUM"—raw, fused and esterified
"AROPLAZ"*—alkyds
NATURAL RESINS—all standard grades

*Registered U. S. Patent Office

All of the S & W research and production facilities are available to the trade for the many pressing problems of these times.

STROOCK & WITTENBERG CORP.

The Business Magazine for Makers & Users of Chemicals

Management, Research, Production, Marketing

CHEMICAL INDUSTRIES

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ABP

A PIONEER THEN—

A LEADER TODAY

IN 1892, in a Virginia valley noted for its vast deposits of pure salt, Mathieson began the construction of the first of three great factories. Over a period of half a century, they were to supply America's growing industries with vital chemicals. Today—fifty years later—the Mathieson plants at Saltville, Va., Niagara Falls, N.Y. and Lake Charles, La., are working twenty-four hours a day to supply the nation's *war* industries with the "raw materials of victory."

This is the over-all picture of a typically American enterprise—The Mathieson Alkali Works. It is a story of growth and progress in chemical research... in developing new products... and in devising more efficient methods of handling and transporting chemicals.

Among Mathieson's early achievements was the development of the Castner electrolytic cell for producing chlorine and extremely pure caustic soda. The first to make bleaching powder in the United States, Mathieson pioneered the manufacture of synthetic ammonia, liquid chlorine and such outstanding chlorine products as calcium hypochlorite and sodium chlorite. Chlorine, today in great demand for war production, is also safeguarding the health of our fighting men on all fronts as calcium hypochlorite, the *mobile* chlorine carrier.

These are but a few milestones in the fifty years of Mathieson Chemicals. They are tangible evidence of the drive and initiative which have marked Mathieson's rise from modest beginnings to a place of leadership in the field of industrial chemicals.

CELEBRATING 50 YEARS OF SERVICE TO AMERICAN INDUSTRY AND PUBLIC HEALTH

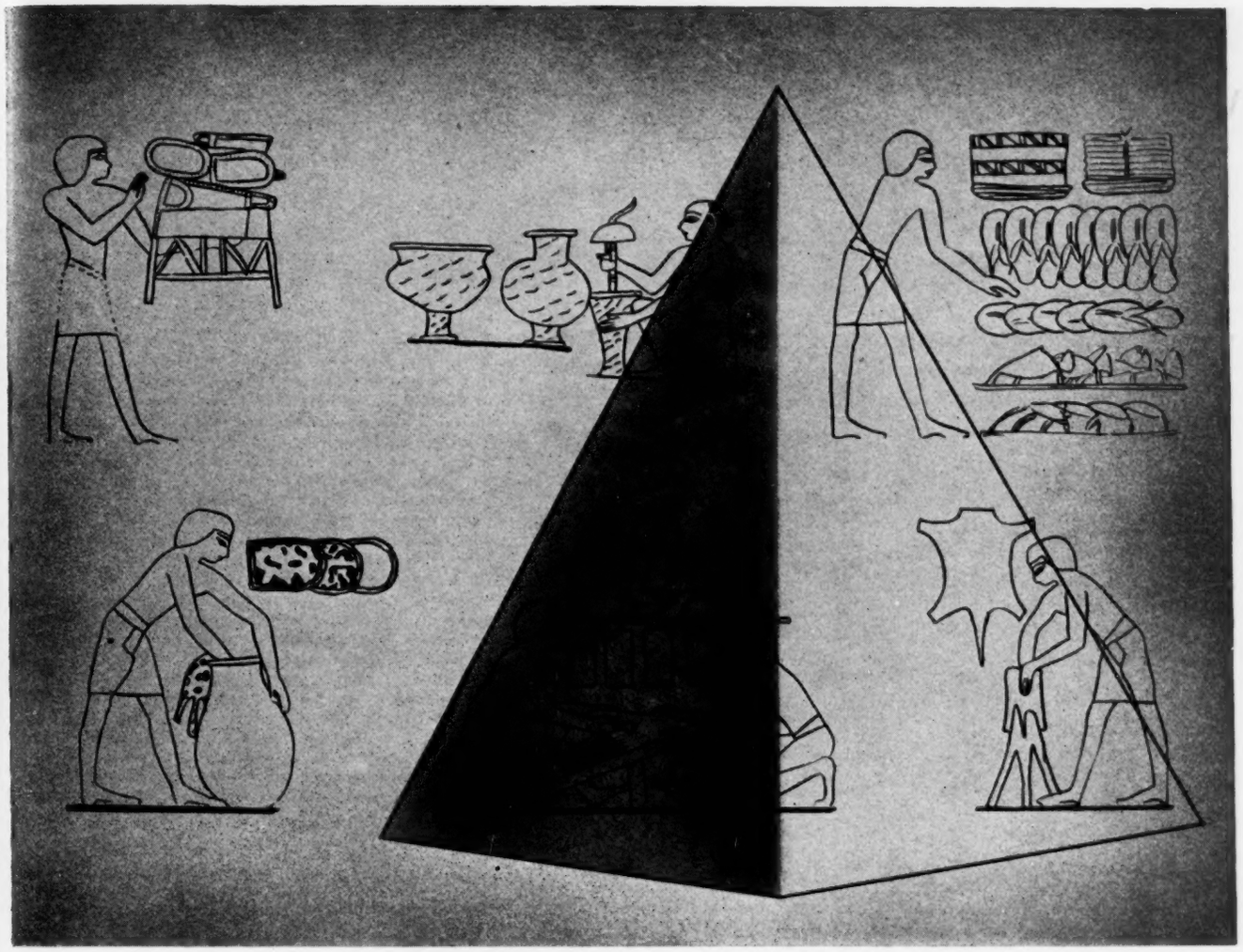
MATHIESON CHEMICALS

The Mathieson Alkali Works, (Inc.) **60 East 42nd Street, New York, N.Y.**

R v.51 July-Dec 1942

United We Stand

Tech



Egyptian Tanning - 2000 B.C.

From ancient stone carvings we have learned that the first crude stages of tanning and shoe manufacture were carried on by the Egyptians as early as 2000 B.C. This undoubtedly involved some form of vegetable tanning, which for centuries was the only practical method of tanning leathers.

In 1884 Chrome Tanning was invented and since has largely supplanted vegetable tanning in making upper leathers, glove and garment leathers. Chrome tanning yields a leather of more compact fibrous structure and the process requires only a few days as against months for the older method.

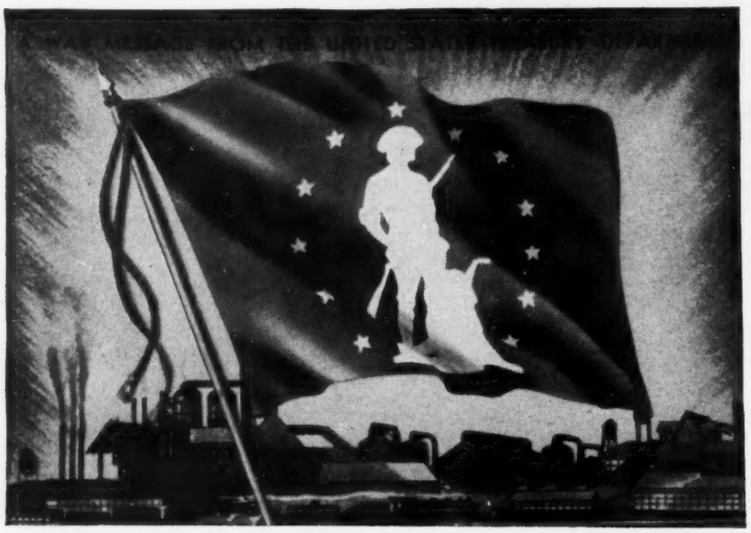
Mutual Chemical Company of America has continuously supplied the Tanning Industry with Bichromates since the invention of Chrome Tanning.

MUTUAL CHEMICAL CO. OF AMERICA NEW YORK N.Y.

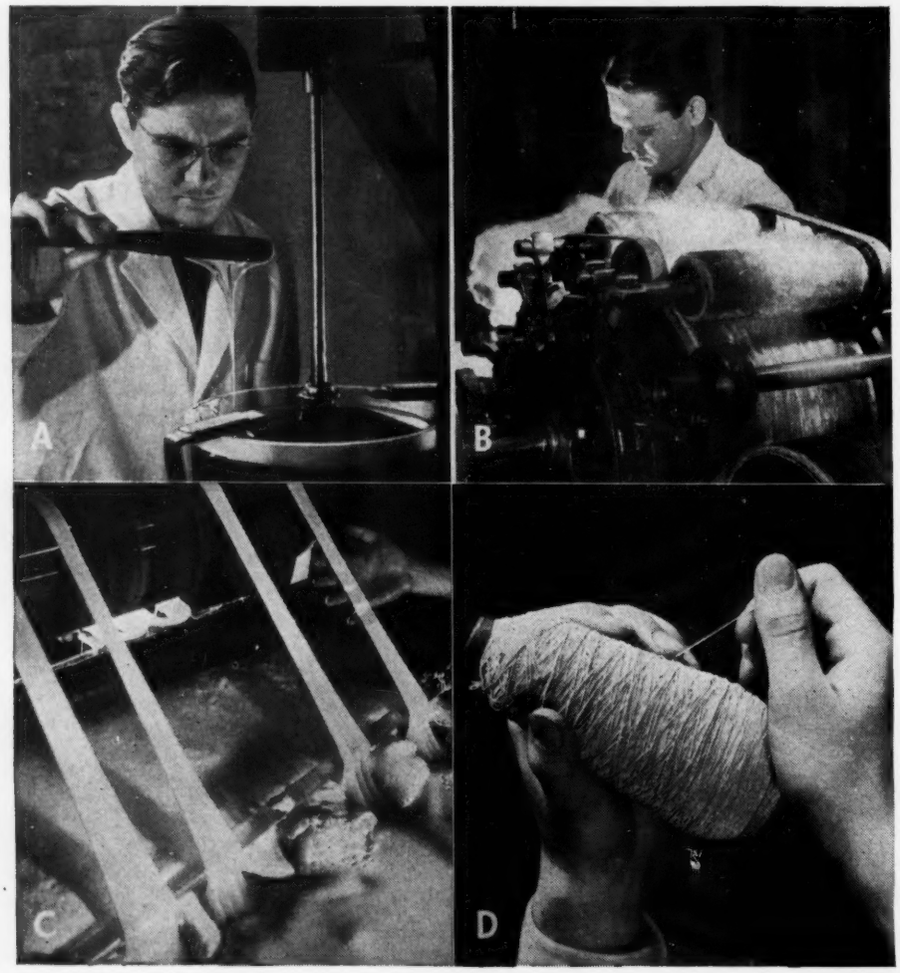
Mutual Chemical Co of America

270 MADISON AVENUE, NEW YORK

Life On The



(*Left*) **SYMBOL OF VICTORY TO COME** is the Minute Man Flag. Wherever it flies, there is a striking forecast of good news for America—news of more ammunition, of more ships, planes, tanks, and guns for the armed forces of the nation on their far-flung battle fronts. The Minute Man Flag means that the group that flies it has attained 90 per cent or more employee participation in the Payroll Savings Plan of the Treasury Department... that its employees are contributing to the success of the nation's arms by turning over a portion of their earnings, regularly every payday, for the purchase of U. S. War Bonds. From every office and factory under this flag, a constant stream of dollars is pouring into the nation's productive efforts, to aid in maintaining without interruption the flow of war materials into the line of battle. The Savings Plan offers to every gainfully employed person, in every walk of life, an opportunity to play a vitally needed part in speeding the coming of victory, by contributing to the extent of his ability to the financing of the war. Under the Voluntary Payroll Allotment Plan in operation at Cyanamid, fifteen of the company's offices and plants have already been awarded the Treasury Department's Certificate of Merit which entitles them to the privilege of displaying the Minute Man Flag.



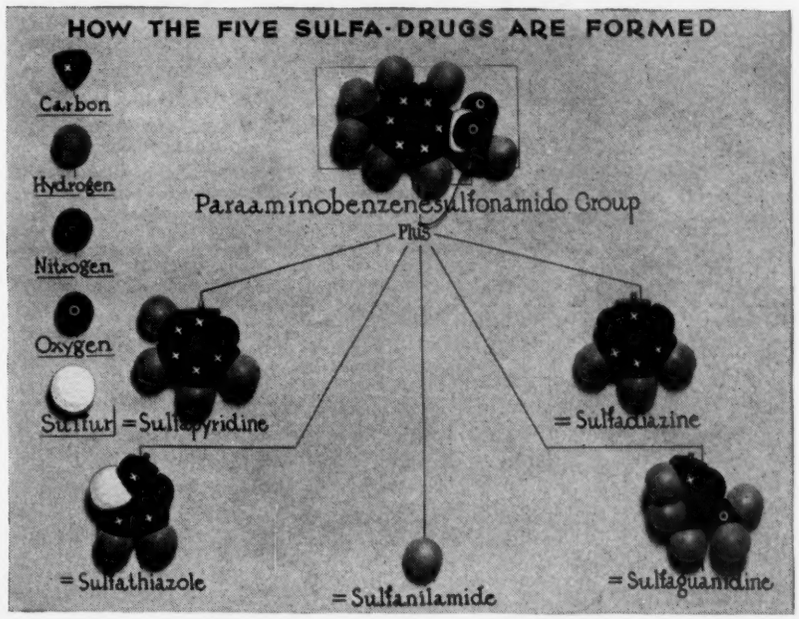
(*Left*) **RESEARCH IN TEXTILES** has brought many new types of fibers into existence from hitherto untapped sources. What is believed to be the first textile fiber ever produced from a vegetable protein has been developed in the laboratories of the Ford Motor Company. Starting point of the fiber is oil-free meal from the soy bean. Specially selected beans are flaked, and the oil is extracted by means of hexane. The protein, which forms about 50 per cent of the meal, is obtained by dissolving the meal in a solution of caustic soda, and treating the solution with sulphur dioxide to precipitate the protein. Protein is then soaked in water and brought into solution by means of a special solvent mixture. Photo (A) shows examination of the solution to assure correct viscosity. Solution is forced through spinnerettes by nitrogen pressure into an acid coagulating bath. (B) shows the fibers being loosened and opened on a carding machine.

(C) Another protein—casein—is ground, chemically treated, and heated to form the source of "Aralac," a textile fiber produced by a subsidiary of National Dairy Products Corporation. Photo shows the casein fibers being forced through spinnerettes under hydrostatic pressure.

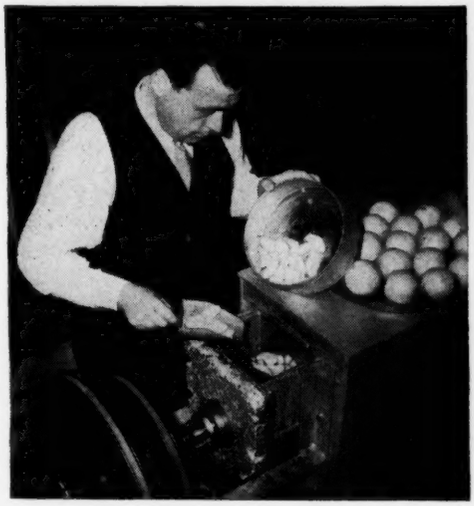
(D) Synthetic rubber thread is now being produced by The B. F. Goodrich Company to replace natural rubber thread for military applications. Civilian uses may be expected to develop later when supplies become available for this purpose. As the textile industry turns to new materials in its production processes—or modifies its processing to meet new requirements—Cyanamid's technical assistance in the application of textile chemicals takes on an added measure of importance.

Chemical Newsfront

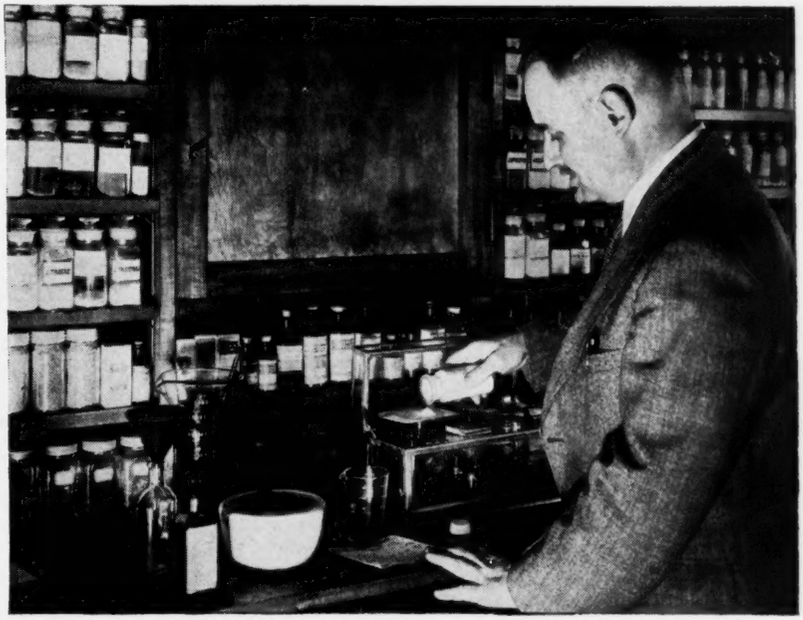
(*Right*) **SULFA DRUG CHEMISTRY** is graphically shown by these models of the molecular structure of the five currently used drugs in the sulfa family. Starting with the paraaminobenzenesulfonamido group, the addition of an atom or group of atoms chemically linked together serves to produce sulfanilamide, sulfapyridine, sulfaguanidine, sulfathiazole, or the newest of the family group—sulfadiazine. Pioneer in the development and investigation of the sulfa drugs is Lederle Laboratories, Inc., a division of American Cyanamid. The illustration of the molecule models is reproduced by courtesy of *Popular Science Monthly*.



(*Below*) **QUICK-FREEZING OF FOODS** by a new "syrup" process is reported to result in faster freezing, more natural taste, and to keep foods fresh longer. Syrup used contains about 53 per cent of varied sugars, and has the property of supercooling. It also forms a permanent, airtight coating around the treated food. Process, known as polyphase freezing, was developed by Luis H. Bartlett at the Bureau of Engineering Research, University of Texas.



(*Right*) **"WASHABLE" OR "WATER-SOLUBLE" OINTMENT BASES** are described as having advantages over greasy types in treatment of certain conditions. AEROSOL* OT, Cyanamid's unusually powerful wetting agent, has been found an effective emulsifier in preparation of several of these new type ointment bases—another instance of its diversified utility.



American Cyanamid & Chemical Corporation

A Unit of American Cyanamid Company

30 ROCKEFELLER PLAZA · NEW YORK, N. Y.

*Reg. U. S. Pat. Off.

WASHINGTON

By T. N. Sandifer

MORE and more the imminence of the Fall elections is making itself apparent around Washington, and it is obvious that even the White House is not immune—nor is this manifestation in the White House merely a sort of fire-horse pawing at the ground tendency.

It is evident in Congress through a more independent appraisal of Administration programs, as in the tax bill, for instance. By this time it is plain that Congress has no idea of letting itself be rushed into approval of any schemes that can bounce this November, and bounce first against the legislator up for election who can be pointed out by his opposition as having voted the wrong way.

T. N. Sandifer

The White House sensitivity can be detected in a new hesitancy to push Congress around too openly; and concretely in a quick decision that the East had to have its Sunday-drivers' gas, even if some ships had to wait for the steel plates that would be used for a trans-continent pipeline. Perhaps this is a gloves-off summary of that particular matter, but gas for autos is a political issue, and nobody in Washington is being misled on the point.

The tapering off process in expansion of materials-producing plants, rather than materials themselves, is leading to some interesting changes in the war-production agencies, meanwhile, which appears to be engaging industry attention more than the political scene at the moment.

The policy now appears definite at the War Production Board that this Board will concern itself henceforth more than ever, with finding materials rather than with the production of items from such materials, and that wherever possible, direct production functions shall be moved into the agencies most immediately concerned.

While a crystallization of present plans probably will take place before this appears, the coming weeks will see a more or less continuous movement in this line.

As Donald Nelson predicted to a small group recently, the actual transition period to Production Requirements would entail considerable pressure on his organization. At this writing some 11,000 third-quarter applications under PRP have come in.

While a considerable part of these were concerned with metals, it is realized that the third quarter program is necessarily one of transition from primary emphasis on preference ratings to a straight-out quantitative control of materials on which ratings may be used. By the time of the fourth quarter a very marked modification of procedures in current use may be anticipated.

Already Priorities Regulation 11, which makes use of the PRP plan mandatory in most fields, has been amended to clarify the interim procedure by companies which had not received a PRP certificate, and to allow companies already operating under this plan during the second quarter to accept delivery of materials rated on that quarter's certificate during the third quarter if delivery has been delayed, in addition to third quarter perquisites.

The recent past has been marked, and probably the trend will continue, by increasing activity on the part of the Alien Property Custodian, especially in taking up alien patent holding in chemicals, or controlling stock interests from abroad. This is strongly reminiscent of World War I, but in this case the effects can be expected to last longer.

There is an increasingly bitter tone evident around Washington toward Axis nations, with strong hints that the post-war settlements whenever they do come, will be less easy-going than on a previous occasion. This theme is worth expansion, if space permitted, and may be reverted to on a later occasion.

The recent past has seen a marked diminution of orders and regulations, compared to earlier records, but there is evidence that while activity is not lessened, it is being more channelized, with the result that accumulations of drastic regulations do not occur in one week, or one day, as formerly.

Nevertheless, recent activity has covered a wide field in chemicals and related fields:

Maximum prices for Vitamin A oils specifically, instead of regulation under a general Fats & Oils Schedule, is foreseen in activity now taking place in the OPA and among producers and concentrators of the industry. One meeting, at San Francisco, June 22, was called specifically to discuss a special price regulation designed to establish a price structure to encourage wider sales.

While sugar stocks have been accumulating, and some adjustments have been made in rationing requirements, with others pending, industrial users of sugar are acting under an arrangement with OPA to pro-rate consumption on a daily basis, in order to maintain activity at stationary levels between ration issues. Some industries have experienced an uneven employment trend incident to producing in their usual way, it is reported.

Definition of jobbers in the hide and glue industry changed in Amendment 3 to Hide & Glue Price Schedule 76, to permit producers to continue to purchase hide glue from other producers.

Three major soap makers—Colgate-Palmolive-Peet, Procter & Gamble, and Lever Brothers, moved jointly to rescind prices which rose an average of 3⅓ per cent in February and March. Additional makers said to be planning to withdraw price advances of last Spring.

Toiletries and Cosmetics Branch of WPB urged manufacturers to find substitutes for certain chemicals in critically short supply—mannitol, sorbitol, and derivatives, which are available only on high priority ratings; wetting agents, emulsifiers such as sulfonated coconut oil or lauryl alcohol, among them.

Laboratory equipment will be restricted to users approved by WPB due to shortage for war production, under L-144, June 12.

Manufacturers of medicines, and other types of industrial receivers of restricted spices, including black and white pepper, allspice, cassia, cloves, ginger, nutmeg, and mace, placed on basis of average monthly consumption by them in corresponding 1941 quarter, under Amendment No. 1, to M-127 and M-127-a as amended, by WPB, June 12.

Pulp and Paper industry asked by WPB to restrict applications for preference ratings. Certain grades of paper erroneously omitted from the Maximum

(*Continued on page 10*)

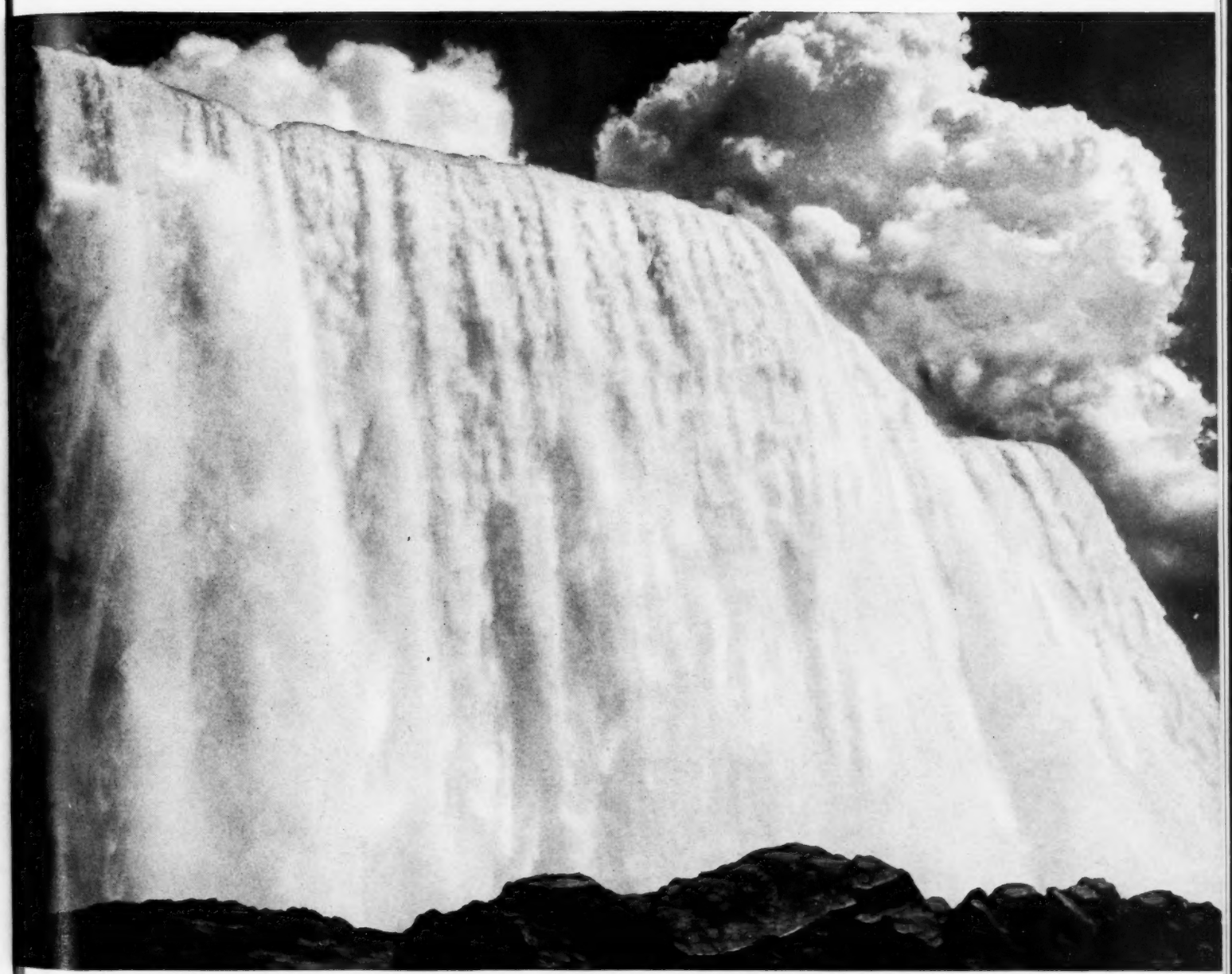
To have ...and TO HOLD

Not for beauty alone is Niagara Falls famous. To people in this country, and in other countries, too, it is an expression of America. In its grandeur they sense the wild, free spirit that has swept this nation on and on with irresistible force. Like the never-ending wheat fields... like the bottomless mines... like the roaring factories and towering cities, it typifies the boundless energy of the U. S. A.

Our youth has found romance and pledged loyalty in the mists of Niagara. Our industry has found power in its cataracts to drive its great dynamos. And the very fact that its power and beauty are shared in peace and friendship with a neighbor country has made it a shrine of good will at which people the world over may take heart. Surely, these great Falls give voice to all that America is fighting for today—the permanent, steadfast, dynamic way of life that can be directed to the good of all but never tamed to slavery.

We who work within sight and sound of Niagara Falls are devoting every ounce of our energies and facilities to speeding the flow of chemicals for Victory.

CAUSTIC POTASH • CAUSTIC SODA
PARA • CARBONATE OF POTASH
LIQUID CHLORINE



EBG Niagara ALKALI COMPANY
60 EAST 42nd STREET, NEW YORK, N. Y.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

NATIONAL SALVAGE:—WPB put into effect July 13 a non-stop nationwide campaign for the salvage of metal scrap, tin cans, fats and a host of other materials. A national advertising campaign is getting under way to stimulate interest in the drive, financed by iron and steel manufacturers, glycerine producers and associated industries. Program is designed to continue as long as America needs scrap. Special emphasis will be placed on building up stockpiles of iron and steel, rubber and other waste materials which can be salvaged through the regular trade channels.

NEW MANAGEMENT:—Senator Bunker of Nevada—the man who told the Senate recently that Basic Magnesium, Inc., stood to make a profit of 4,280% on an investment of less than $50,000—told the Senate July 14 that the Defense Plants Corp. had signed a contract to pay a New York firm $100,000 "to provide competent management" for the operation of the Las Vegas mining project.

PERSONNEL:—Chemicals Branch of the War Production Board has announced changes in personnel in the Protective Coatings Section. The loan of J. B. Davis, who has been Chief of that Section, was requested by the Board of Economic Warfare for special assignment, and his release was granted by WPB. E. H. Bucy has been appointed Chief of the Section, and Wells Martin as Assistant Chief. M. Rea Paul has been appointed Special Technical Assistant to Bucy.

Charles C. Concannon, head of all chemical activities of the Bureau of Foreign and Domestic Commerce in the U.S. Commerce Department for many years, has been made Chief of the Durable Goods Branch of the Materials Unit in the department.

RECENT GOVERNMENT ORDERS:—Superphosphate prices to government placed on same maximum plane as those paid by other consumers by OPA action.

Application of Distillation Products, Inc., setting maximums for that concern on fish liver oil residue, and vegetable oil residue, hitherto not possible to price within previous regulations, approved by OPA, effective July 3. (Orders # 4 & 5 to Schedule 53)

Interpretation # 2 to General Preference Order M-93, Distribution of Woodpulp, issued by WPB, excluding paper or paperboard side runs, and covering deliveries and shipping schedules.

Maximum Agar price, for Agar produced and sold by the San Diego plant of the American Agar and Chemical Company, established at $3.00 per pound f.o.b. San Diego, by OPA in GMPR, Section 3 (b).

Maximum price of 2 cents per gallon plus delivered cost, ordered by OPA on toluene authorized by WPB to be released to certain producers of TNT and DNT.

Manufacturers of crude glycerine authorized to add to maximum price of their product, the excess freight charge for returning empty drums when shipments are made to a refinery more distant from a plant than the nearest refinery, under OPA amendment # 2 to Revised Price Schedule # 38, Glycerine.

Alien Property Custodian announced assumption of control over General Dyestuff Corporation, Byk, Inc., Siemens, Inc., all of New York, and Ajax Transportation Company, Nashville, Tenn.

LAST MINUTE NEWS AT PRESS TIME DIGESTED FOR C.I. READERS

CHEMICAL INDUSTRIES

CHEM-O-GRAM

WASHINGTON PRICES PRODUCTION PERSONNEL

OPA has assumed rationing authority over all commodities in Puerto Rico and Virgin Islands, exempting sales to armed services, other Government agencies.

MONSANTO BOOKLET:—Monsanto Chemical Co. has just released its new 170-page 26th edition of "Monsanto Chemicals." This most useful and informative chemical trade catalog contains chemical names, trade names, formulas, standard forms or grades, uses, general information, and available special literature on all of the chemicals and plastics manufactured by Monsanto. A general technical section includes tables of physical constants for some of the more common chemicals. All this has required a threefold increase in both number and size of pages over the last edition. Requests for copies should be on business letterhead addressed directly to the company at St. Louis, Mo.

SPEED IN WAR PRODUCTION:—Interchemical Corp., N. Y. City, has organized the technical and sales staffs of all its divisions and subsidiaries in a coordinated effort to make its plant equipment available for war work. A "Manual of Products" has been compiled, edited and published by the company to tell what each division is doing and what each division can make. This is available to government bureaus and authorized purchasing personnel.

BUREAU OF MINES EXPANDS:—A $500,000 electrodevelopment laboratory, where Bureau of Mines metallurgists plan to study the recovery and processing of minerals from the Pacific Northwest with electrical energy from Bonneville and Grand Coulee Dams, will be established in that region within the near future. Plans for an immediate study of the various methods of producing sponge iron—described by metallurgists as an acceptable substitute for scrap iron in manufacturing steel—and for the erection of pilot plants to guide future operations in this field, have been launched by the bureau. Seeking additional sources of strategic and essential minerals for the production of tanks, planes, ships, guns and other weapons necessary to the Nation's war schedule, the Bureau of Mines has launched an expansion of its program of field and laboratory work to establish the possibility of increased production from domestic deposits.

Aided by a $75,000 appropriation from the Congress, the Bureau of Mines has embarked on more intensive studies of processes developed by its metallurgists to increase the Nation's output of chromium, the strategic metal used in the manufacture of armor plate, armor-piercing projectiles, high-speed tool steels and other essential war materials.

All of these developments were revealed recently by Dr. R. R. Sayers, Director of the Bureau of Mines.

AMMONIUM SULFATE ALLOCATED:—Fertilizer manufacturers got their first allocation of ammonium sulfate from the WPB July 13 based upon the amount of nitrogen they received last year. Final prices, at this writing, have not been determined but an OPA decision is expected shortly after meeting now in progress in Washington. Those whose supply of liquid ammonia has been cut off will be allowed to take fairly good quantities of the sulfate (in most cases).

For Dependable Fine Chemicals

Specify

FINE HEYDEN CHEMICALS

HEYDEN

Write for Current Products List

Benzyl Chloride

Refined and Technical Grades

Uniformity assured by Heyden high standards • Cleanliness maintained to point of use by modern containers

Benzaldehyde • Benzal Chloride
Benzoic Acid • Benzo Trichloride
Benzoate of Soda
Formaldehyde • Paraformaldehyde
Hexamethylenetetramine
Salicylic Acid • Methyl Salicylate
Pentaerythritol

HEYDEN *Chemical Corporation*

50 UNION SQUARE, NEW YORK, N. Y. CHICAGO BRANCH: 180 N. WACKER DR.

PROTECTION AGAINST MOISTURE LOSS

Not only do Bemis Waterproof Bags protect against moisture from without, but they can be made to prevent escape of desirable moisture from within. Products which tend to dry out en route or in storage are now giving complete satisfaction to users through shipment in Bemis Waterproof Bags.

These time-tested and proven shipping containers also can be made to retain desirable aromas and repel objectionable odors—shut out dust and dirt—resist acids and grease. And because of their strength and toughness, Bemis Waterproof Bags provide extra protection against rough handling.

WATERPROOF DEPARTMENT

BEMIS BRO. BAG CO.

ST. LOUIS, MO. • BROOKLYN, N. Y.

Washington

(*Continued from page 8*)

Price Regulation No. 129 (Paper and Paper Products) have been added in Amendment No. 4 to this Regulation.

Paper, paperboard, paper products, waste paper, removed from inventory restrictions under Priorities Regulation I, and other WPB orders through an amendment to General Inventory Order M-161, the purpose of which is to allow accumulation of inventories in anticipation of possible transportation difficulties.

The container situation continues to become more drastic in other fields; manufacture or use of tinplate or terneplate cans for many chemicals, varnishes, paints, and various special products is now prohibited in a revision of Conservation Order M-81;

Manufacturers of cans for several vegetables, fats, and scores of other products have been ordered in Conservation Order M-81-a, to substitute wherever possible, electrolytic tinplate and chemically treated blackplate, to further conserve tin;

An amendment to Conservation Order M-158 was issued to enable steel drum manufacturers to use some 150,000 gallons of exterior drum coating which they have had at hand, but which the initial order barred from use; the order is limited to drums of 29 gauge or heavier steel, and includes any Class A coating, containing tung, oiticica, perilla, or dehydrated castor oils; alkyd, phenolic, vinyl, urea or melamine resins; cellulose esters or pigmented coatings made on or before June 5;

Meanwhile further restrictions have been placed on export of metal drums and containers, also gas cylinders, due to growing shortages of these container types.

In chemicals, allocation controls have been announced, effective July 1, on Chemical Cotton Pulp, in Conservation Order 157; and in Order M-178, on Butadiene, covering producers except those making less than 5 tons of butadiene per month; Ethyl Cellulose in Preference Order M-175; Pyrethrum, in M-179;

Restrictions on use of chrome chemicals, including those used in printing inks, ceramics, soap and glass, were issued in revisions of Orders M-18-b and M-53;

Restrictions have been placed on sales of quinine and other anti-malarial agents in an amendment to Conservation Order M-131; The definition of agar in Conservation Order M-96 has been broadened to include wet and dry forms, to prevent diversion to non-defense purposes.

An amendment to Conservation Order M-103 increases to 70 per cent of 1941 use, the supply available for civilian purposes of anthraquinone vat and other dyes for the July 1-September 30 period.

(*Continued on page 104*)

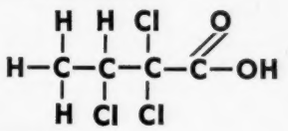
3 CHLORINATED ORGANIC CHEMICALS *developed by* PENN SALT RESEARCH

Hand in hand with manufacturing, Penn Salt carries on unremitting research . . . seeking new compounds, improvements in present products and better production methods.

Now from our Research Laboratories come three chlorinated organic chemicals with interesting properties and possibilities. One or more of them may aid you in replacing restricted essential materials, help you in developing new products, or suggest important changes in your present processes.

2, 2, 3, TRICHLOROBUTYRIC ACID*

$CH_3 \cdot CHCl \cdot CCl_2 \cdot COOH$



PHYSICAL PROPERTIES:

Appearance—white crystalline solid.
Molecular Weight—191.5.
Melting Point—60° C.
Boiling Point—236° C. with only slight decomposition at the boiling point.
Hygroscopic.
A slightly stronger acid than trichloroacetic acid.
Mild odor.
Soluble in water.
Soluble in organic solvents.

*Available as a white crystalline solid, in 60% aqueous solution, or in other strengths.

SUGGESTED USES:

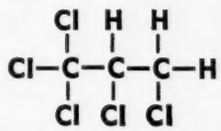
Its similarity to trichloroacetic acid suggests its application where a rather strong organic acid is needed. It appears to have possibilities as a tanning assistant. As an intermediate, it enters into the usual acid reactions forming salts and esters, and in addition it contains reactive halogens greatly increasing its value for the synthesis of further useful compounds.

A full series of aliphatic and other esters have been prepared in our Research Laboratories and are available in research quantities.

Many of these esters are characterized by a fine odor which suggests the possible use of the lower members of the series in soaps, perfumes, and other articles in which fragrance is desirable. The higher aliphatic and polyhydric alcohol esters such as the glycol esters, on the other hand, being practically without odor, but of high viscosity, are potential plasticizers. Formulators will be interested in the penetrant and solvent properties of many of these new materials. Leather, textiles, and paper are a few of the fields suggested for possible use.

1, 1, 1, 2, 3, PENTACHLOROPROPANE

$CCl_3 \cdot CHCl \cdot CH_2Cl$



PHYSICAL PROPERTIES:

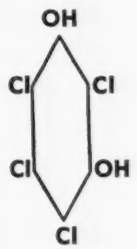
White crystalline solid.
Melting not lower than 178° C. for pure grade, 140° C. for technical grade.
Sublimes.
Has odor of camphor.
Soluble in organic solvents.
Insoluble in water.

SUGGESTED USES:

Its odor suggests its use as an insect repellent. Its compatibility with nitrocellulose and other plastics indicates possible plasticizer value. As an intermediate, it can be dehalogenated, dehydrohalogenated, and enter into other organic halide reactions, producing additional interesting compounds.

TETRACHLORORESORCINOL

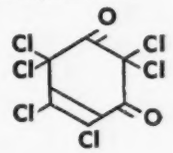
$C_6Cl_4(OH)_2$



PHYSICAL PROPERTIES:

White crystalline solid.
Melting point—141° C.
Faint pleasantly phenolic odor.
Soluble in organic liquids, hot water or dilute alkali—sparingly soluble in cold water.

CHEMICALLY, it is a mild reducing agent, and with chlorine yields* hexachlorocyclohexene-1-dione, 3-5, a quinone of interesting possibilities:



*Beilstein, Vol. VI page 820

SUGGESTED USES:

Condensation of this resorcinol for the preparation of eosin-type derivatives should lead to a series of compounds of possible dyestuff interest. Its antiseptic use is indicated as of probable practical value. In these days of need for phenolics, this compound will probably receive careful evaluation as to uses.

We shall be glad to send samples for investigation and to cooperate with you in working out applications. Probable prices of commercial quantities, when available, supplied on request. Write Dept. CI.

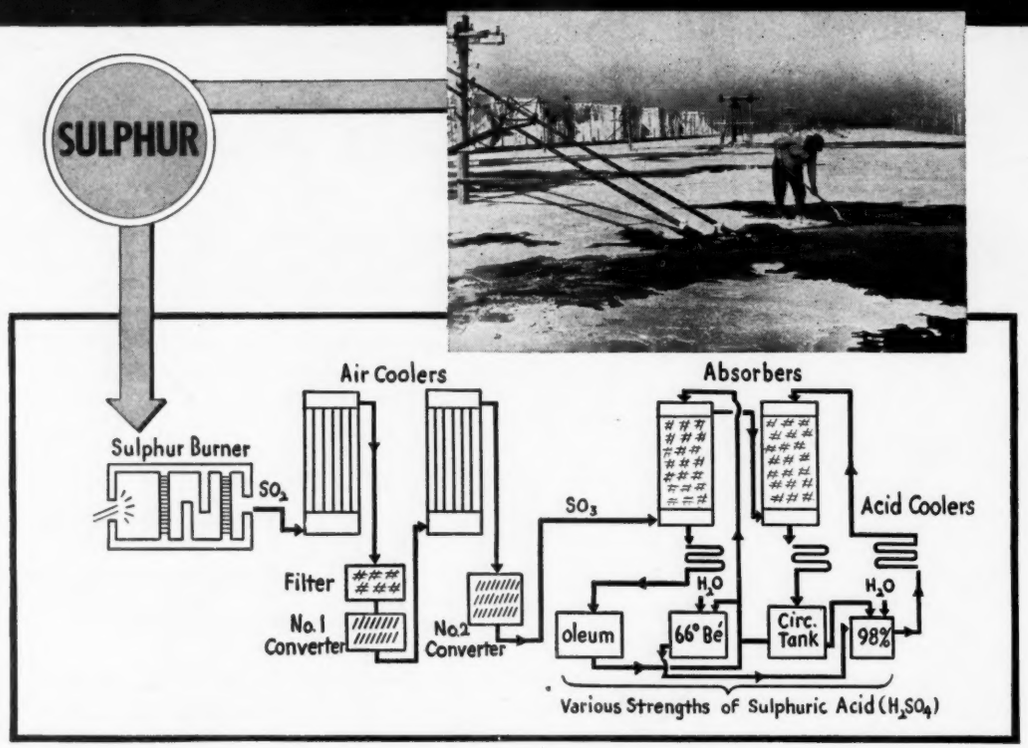
PENNSYLVANIA SALT MANUFACTURING COMPANY

Chemicals

1000 WIDENER BUILDING, PHILADELPHIA, PA.

NEW YORK • CHICAGO • ST. LOUIS • PITTSBURGH • WYANDOTTE • TACOMA

HOW SULPHUR SERVES INDUSTRY



SULPHURIC ACID

{Contact Process}

Sulphur is burned to sulphur dioxide (SO_2). This is cooled, filtered, and passed to a converter. Here a catalyst causes the sulphur dioxide to take on an atom of oxygen to form sulphur trioxide (SO_3). Sulphur trioxide then compounds with water into sulphuric acid (H_2SO_4).

Sulphuric acid is used in the preparation of so many products—fertilizer, rayon, steel, textiles, etc.—that it has been called the "pig iron" of the chemical industry. Its consumption is the yardstick often used to gauge the volume of industrial activity. It is easily and economically made from Sulphur produced by Texas Gulf because it is 99½% pure and free from arsenic, selenium and tellurium.

Sulphuric acid is of vital importance to American industry. To the acid manufacturer, a dependable source of Sulphur is of equal importance. Texas Gulf Sulphur Company has above ground ready for shipment more than a year's supply for the entire nation. This, together with large underground reserves and efficient mining methods, is assurance of an unfailing supply.

TEXAS GULF SULPHUR CO.
75 E. 45th Street New York City
Mines: Newgulf and Long Point, Texas

7-TG-6

Reduce CORROSION LOSSES DEPRECIATION MAINTENANCE EXPENSE

in Pickling, Plating and Other Processes Involving Electrolytic Action

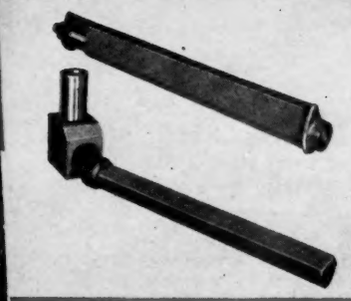
Use NATIONAL and KARBATE TRADE-MARK TRADE-MARK CARBON and GRAPHITE PRODUCTS

● Carbon and graphite products are adapted to a wide variety of applications where difficulties are encountered with other materials as a result of thermal shock or reaction with process materials. They are resistant to the action of most acids, alkalies and solvents, possess good mechanical strength and exceptional resistance to thermal shock. Graphite and graphite base "Karbate" products have higher thermal conductivity than most metals. "Karbate" materials are impervious to seepage of liquids and gases. Porous carbon and graphite products, of high permeability, are also available.

Carbon and graphite products are manufactured in a variety of forms and, being easily machined, can be fabricated to meet almost any structural requirement.

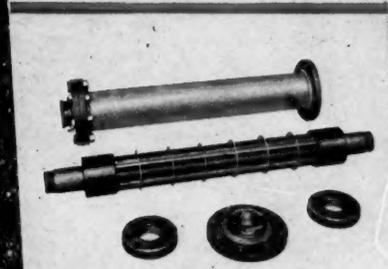
Thousands of dollars are being saved in the metal and process industries by the use of carbon and graphite elements in the construction of equipment subject to corrosive action or severe thermal shock. Products shown at right illustrate the versatility of these materials.

WRITE NEAREST DISTRICT OFFICE FOR INFORMATION ON THESE PRODUCTS



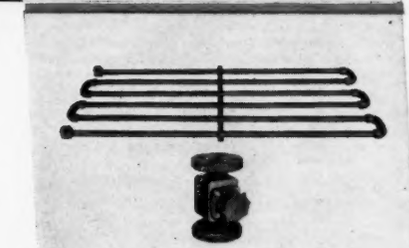
POROUS CARBON AND GRAPHITE

For agitators, steam spargers, gas diffusers and filters. Several grades, differing in degree of permeability, are available. Resistant to both corrosion and thermal shock. Can be fabricated in practically any required form.



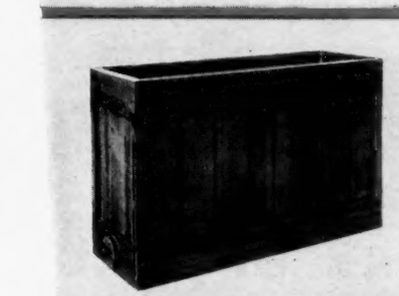
HEAT EXCHANGERS

Constructed from "Karbate" tubes and fittings. Bayonet, immersion, cascade, concentric tube, tube bundle and gas flame types. Shell and tube types with either metal or "Karbate" shell. Many installations in successful use for heating, cooling, condensation or absorption of corrosive materials.



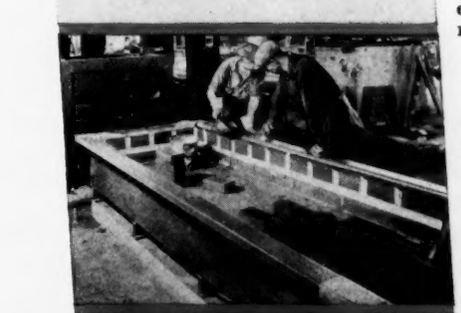
PIPE, VALVES, PUMPS AND FITTINGS

For the construction of conveying or circulating systems carrying or in contact with corrosive materials, carbon, graphite and "Karbate" pipe and accessories eliminate corrosion difficulties. Permit construction of complete circulating systems in which solution has no contact with metal.



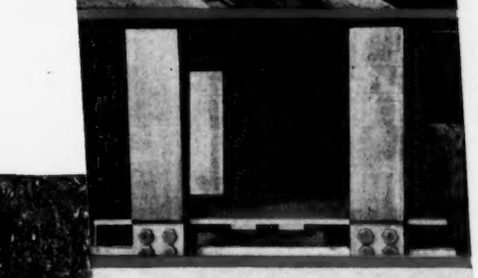
FABRICATED CONTAINERS

Tanks, vats and other containers for corrosive materials can be constructed from carbon, graphite and "Karbate" parts, providing economical and permanent construction.



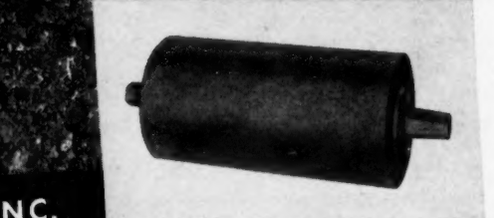
TANK LININGS

Carbon and graphite brick and other special shapes provide a durable lining for pickling tanks and other containers where resistance to corrosion or thermal shock is essential.



GRAPHITE ELECTRODES

In the electrolytic pickling of strip steel, fabricated graphite electrodes provide increased life, ease of installation and freedom from reaction with pickling solution. All parts made of graphite.



CARBON ROLLS

Carbon not attacked by most plating or pickling solutions. Have demonstrated long life and improved performance.

GRAPHITE BEARINGS

Self lubricating. Can be machined to close tolerance. Bearings, bushings and rings of graphite or carbon-graphite composition are used where oilless or corro-

NATIONAL CARBON COMPANY, INC.
Unit of Union Carbide and Carbon Corporation
UCC
CARBON SALES DIVISION, CLEVELAND, OHIO
General Offices: 30 East 42nd St., New York, N. Y.
Branch Sales Offices: New York • Pittsburgh • Chicago • St. Louis • San Francisco

declare

WAR ON WASTE

with NUCHAR *active* CARBON

RECOVERY OF ACIDS FROM PROCESS LIQUOR

A large Eastern manufacturer for years had thrown away daily, great quantities of process liquors because of contamination. As these liquors contained a mixture of two valuable acids, the company investigated every possible method for recovering these vital war chemicals. Even in normal times this problem would be important because of the value of the acids going to waste; and now it is even more acute because of the shortage of these acids.

After much research the company devised a method of recovery which oddly enough is very simple. A day's supply of this waste liquor (containing an equivalent of 8000 pounds of mixed acids) is accumulated in a large vat and treated with approximately 20 pounds of NUCHAR Active Carbon. This is allowed to settle for several hours and then the clear, colorless, supernatant liquid is run through a small polishing press and is ready for re-use. By this process NUCHAR saves valuable, vital acids that would otherwise be wasted.

NUCHAR

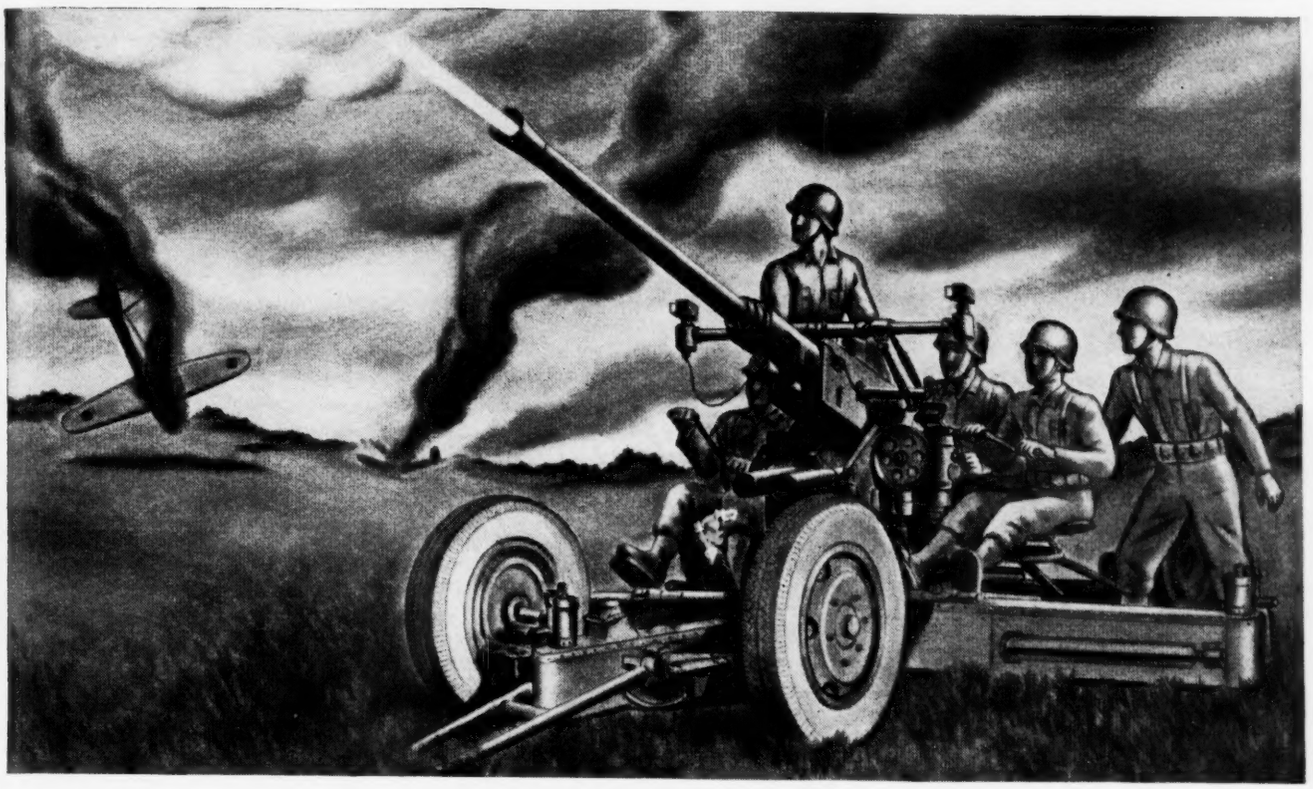
INDUSTRIAL CHEMICAL SALES

DIVISION WEST VIRGINIA PULP & PAPER COMPANY

230 PARK AVENUE, NEW YORK CITY
35 E. WACKER DRIVE, CHICAGO, ILLINOIS
748 PUBLIC LEDGER BLDG., PHILADELPHIA, PA.
844 LEADER BLDG., CLEVELAND, OHIO.

The Best Defense Against *Strafing*

Low-flying planes that zoom by at terrific speed are tough targets—but not for this U. S. 40 mm. Bofors, a rapid-firing gun that fires at any angle with great destructive power.



The Best Defense Against *Waste*

War calls for products, as well as guns and ships and planes. And at a time when every product is doubly important—and waste is doubly serious—defense often starts with the "arming" of a drum.

You can make every drum—and every drop in it—safe from pilferage, leakage and other losses by equipping it with Tri-Sure Closures. Tri-Sure—with its *triple protection*—gives you three weapons against waste: a *seal* which cannot be removed unless deliberately destroyed; a *plug* which is held tightly in place; a *flange* which assures complete drainage.

The Tri-Sure way is the *sure* way to make every shipment safe from every hazard. Take the first step now to make Tri-Sure part of *your* defense plan. Write for complete information on Tri-Sure Closures.

Tri-Sure
Reg. U. S. Pat. Off.
CLOSURES

AMERICAN FLANGE & MANUFACTURING CO. INC., 30 ROCKEFELLER PLAZA, NEW YORK, N. Y.

STANDARD SILICATES

will help conserve CRITICAL WAR MATERIALS

Here are three important suggestions for the use of your silicates—

1. USE THE RIGHT GRADES

Standard Silicates are made in many standard and special grades for a wide variety of uses. From this list, you can pick the right grades for your work.

2. INSIST ON UNIFORM QUALITY

The dependable uniformity of Standard Silicates becomes especially valuable when your production nears capacity, costs must be kept low and critical materials conserved.

3. USE STANDARD TECHNICAL SERVICE

To help you get the most out of your silicates, and to select the right grade for each particular job, call Standard Technical Service.

DIAMOND ALKALI COMPANY
STANDARD SILICATE DIVISION
PITTSBURGH, PA.
Plants at CINCINNATI · JERSEY CITY · LOCKPORT, N.Y. · MARSEILLES, ILL. · DALLAS, TEXAS

ALKALI

Public Library

W & B DRUMS CIRCLE THE EARTH

WILSON & BENNETT

Steel Containers stand guard to provide safe protection against leakage or spoilage of:

- OIL PRODUCTS
- FOOD STUFFS
- VITAL CHEMICAL PRODUCTS

These air tight steel drums and pails are available for packing and shipping perishable products for military or essential civilian use. In the new Steri Seald Lined Containers, foods and chemicals can be shipped in perfect safety to the far ends of the earth as fresh and pure as the day they were packed.

●Steel drums and pails are made in sizes from 3 gal. to 55 gal. with a wide variety of covers and pouring spouts for convenient handling of liquids and semi-solids.

WILSON & BENNETT MANUFACTURING CO., CHICAGO, ILL.

Subsidiary of Inland Steel Company

Plants at Chicago, Jersey City and New Orleans ● Sales offices in principal cities

Makers of Steel Drums and Pails

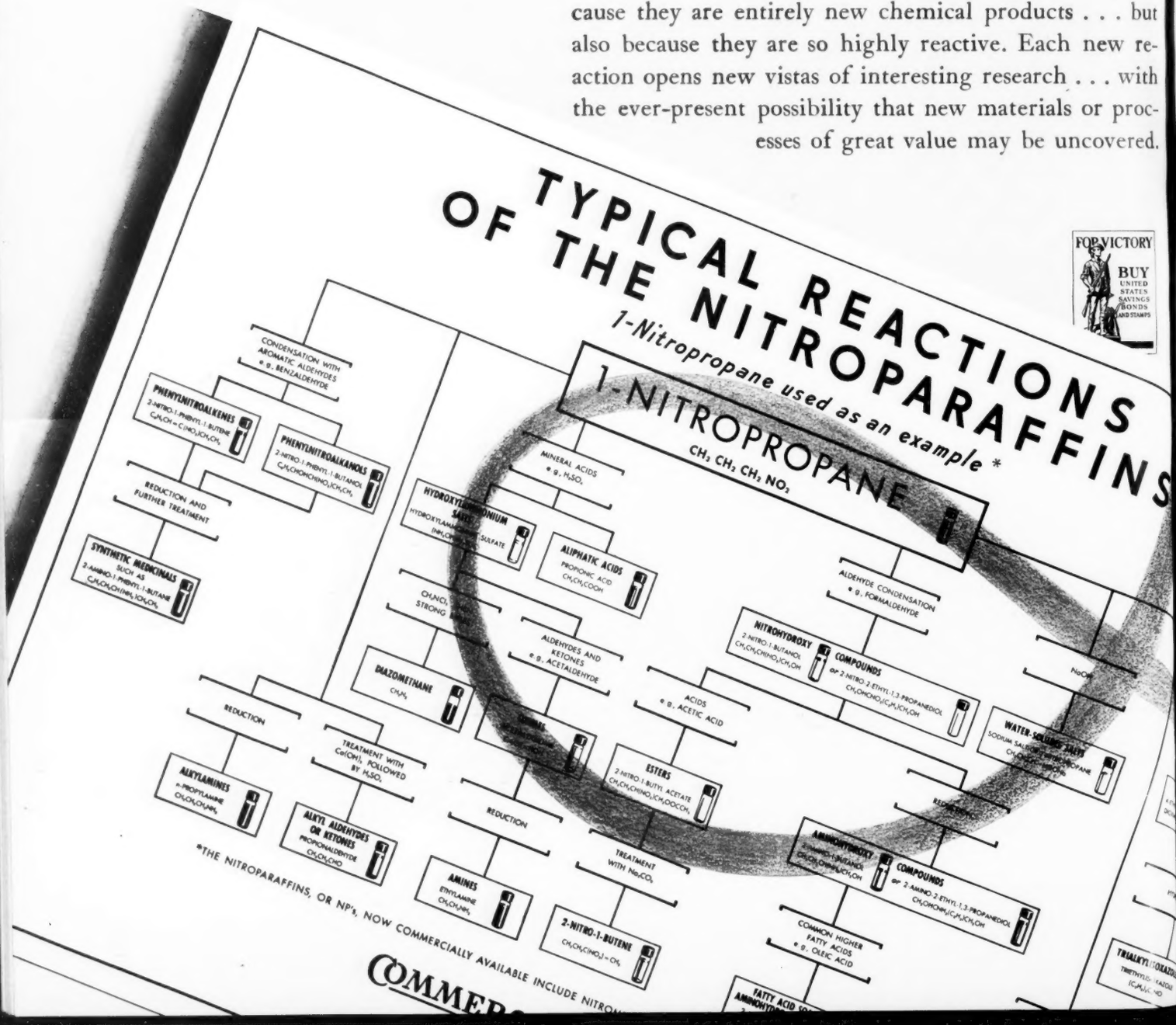
THE NITROPARAFFINS

Nitromethane	Nitroethane	1-Nitropropane	2-Nitropropane
CH_3NO_2	$CH_3CH_2NO_2$	$CH_3CH_2CH_2NO_2$	$CH_3CH(NO_2)CH_3$

adventures in...

Nitroparaffin Syntheses

Chemists who have already experimented with them tell us there are no more intriguing materials for research today than the Nitroparaffins. Perhaps it is not only because they are entirely new chemical products . . . but also because they are so highly reactive. Each new reaction opens new vistas of interesting research . . . with the ever-present possibility that new materials or processes of great value may be uncovered.



these reactions should suggest many others...

Nitro Alcohols* are made by condensing an aldehyde with a Nitroparaffin:

$$CH_3CH_2CH_2NO_2 + C_3H_7CHO \longrightarrow CH_3CH_2\underset{\displaystyle NO_2}{\underset{|}{C}}HCHOHC_3H_7$$

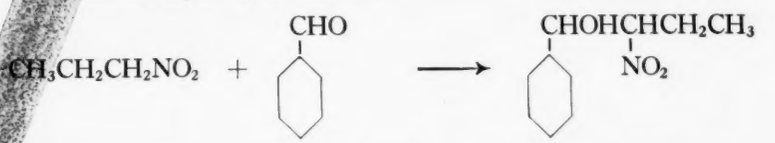
1-Nitropropane — Butyraldehyde — 3-Nitro-4-heptanol

Chlorinated Nitroparaffins are obtained when the NP's are treated with chlorine in aqueous, alkaline solutions:

$$CH_3CH_2NO_2 + 2Cl_2 + 2NaOH \longrightarrow CH_3\underset{\displaystyle Cl}{\underset{|}{C}}NO_2 + 2NaCl + 2H_2O$$

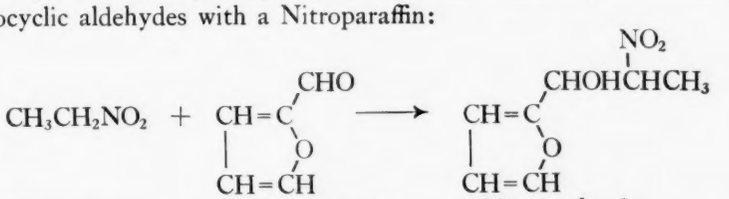
Nitroethane — 1, 1-Dichloro-1-nitroethane

Aromatic Nitrohydroxy* derivatives can be produced by condensing an aromatic aldehyde with an NP:



1-Nitropropane — Benzaldehyde — 2-Nitro-1-phenyl-1-butanol

Heterocyclic Nitrohydroxy* derivatives are made by condensing heterocyclic aldehydes with a Nitroparaffin:



Nitroethane — Furfuraldehyde — 2-Nitro-1-furyl-1-propanol

**The corresponding amine can usually be made by hydrogenating the nitro compound.*

Today, when the future of America lies in our capacity to produce, chemists can make no greater contribution than to find new production short-cuts and new or improved materials that will relieve critical shortages.

We will gladly furnish samples for laboratory experiment and work with you on problems involving the nitroparaffins.

•

During the past six months, 7,716 chemists have expressed their interest in these compounds by asking for this 40-page Data Book, "The Nitroparaffins—New Worlds for Chemical Exploration." We will gladly send you a copy, too, on request.

COMMERCIAL SOLVENTS
Corporation

17 East 42nd Street, New York, N. Y.

PLAN FOR TOMORROW ★ INVESTIGATE THE NITROPARAFFINS TODAY!

Caustic keeps 'em rolling...

• Every pound of rubber that is reclaimed from the junk heap is part of a larger reclamation program . . . helping to win back half a world that is being subjected to systematic waste. • In the process of reclaiming rubber, caustic soda plays an important part, the dissolving of cotton fabric. • But this is only one of the many wartime uses for caustic soda. A vital chemical product, it helps to recover tin from scrap, to refine petroleum products and to produce glycerine for explosives. • Michigan Alkali Caustic Soda, along with many other Michigan Alkali Products, is helping to further the progress of the nation in war, as it has done through many years of peace.

MICHIGAN ALKALI COMPANY

FORD BUILDING, DETROIT, MICHIGAN

NEW YORK • CHICAGO • CINCINNATI • ST. LOUIS • CHARLOTTE • WYANDOTTE

DISTRIBUTORS IN ALL PRINCIPAL CITIES

SODA ASH • CAUSTIC SODA • CHLORINE • BICARBONATE OF SODA • CALCIUM CARBONATE • CALCIUM CHLORIDE • DRY ICE

Have you investigated these New Synthetic Organic Chemicals?

—They are available in research quantities

Chemical	Formula	Boiling Point °C. at 760 mm.	Suggested Uses
Acetoacet-o-toluidide	$CH_3COCH_2CONHC_6H_4CH_3$	(a)	Dyestuff intermediate
Benzyl "Cellosolve"	$C_6H_5CH_2OCH_2CH_2OH$	256	High-boiling solvent
Butyl "Cellosolve" Acetate	$C_4H_9OCH_2CH_2OCOCH_3$	192	Lacquer solvent
"Dehydranone" (Dehydracetic Acid)	$CH_3COCHCOCH{:}C(CH_3)OCO$	(b)	Camphor-like plasticizer
Dichlorethyl Formal	$CH_2(OCH_2CH_2Cl)_2$	218	Elastomer intermediate
Dichlorisopropyl Ether	$(ClCH_2(CH_3)CH)_2O$	187	Textile assistant
Diethyl "Cellosolve"	$C_2H_5OC_2H_4OC_2H_5$	121	Nitrocellulose solvent
Diglycol Diacetate	$(CH_3COOCH_2CH_2)_2O$	250	Printing ink solvent
Diisopropanolamine	$(CH_3CHOHCH_2)_2NH$	249	Emulsifying agent intermediate
Dimethyl Dioxane	$OCH(CH_3)CH_2OCH_2CH(CH_3)$	117	Solvent, extractant
Dimethylethanolamine	$(CH_3)_2NCH_2CH_2OH$	133	Emulsifying agent intermediate
N-Ethyl Morpholine	$CH_3CH_2NCH_2CH_2OCH_2CH_2$	138	Solvent, emulsifying agent
Glycol Diformate	$HCOOCH_2CH_2OCOH$	177	Solvent, embalming agent
Hexanol	$CH_3(CH_2)_4CH_2OH$	157	Drug intermediate, perfumes
Hexyl Ether	$C_6H_{13}OC_6H_{13}$	226	Defoamer, inert reaction medium
Isopropanolamine	$CH_3CH(OH)CH_2NH_2$	160	Emulsifying agent, intermediate
Methyl "Carbitol" Acetate	$CH_3COOC_2H_4OC_2H_4OCH_3$	209	Printing ink solvent
Methyl "Cellosolve" Acetal	$CH_3CH(OCH_2CH_2OCH_3)_2$	207	Source of nascent acetaldehyde
Methyldiethanolamine	$CH_3N(C_2H_4OH)_2$	247	Intermediate, emulsifying agent
4-Methyl Dioxolane	$CH_3CHOCH_2OCH_2$	85	Cellulose acetate solvent
N-Methyl Morpholine	$CH_2CH_2OCH_2CH_2NCH_3$	115	Emulsifying agent, intermediate
N-Phenyl Morpholine	$C_6H_5NCH_2CH_2OCH_2CH_2$	(c)	Dyestuff intermediate
Polyethylene Glycols	$HO(CH_2CH_2O)xH$	(d)	Solvents, plasticizers, alkyd resins
Sodium Acetoacetyl-p-sulfanilate	$CH_3COCH_2CONHC_6H_4SO_3Na$	(e)	Dyestuff intermediate
Tetraethanolammonium Hydroxide	$(HOCH_2CH_2)_4NOH$	(f)	Solvent, strong base
Trichlorethane	$ClCH_2CHCl_2$	113	Solvent, extractant
Triglycol Dichloride	$ClC_2H_4OC_2H_4OC_2H_4Cl$	241	Solvent, plasticizer, intermediate

(a) Melts at 106°C. (b) Melts at 108°C. (c) Melts at 52 to 56°C. (d) Non-volatile, hygroscopic (e) Aqueous solution (f) Melts at 123°C.

This is a summary of research chemicals **announced in our recent advertisements. Although in most cases, only research quantities of these chemicals are available now, it is possible that commercial quantities will be made in the future if important uses develop.**

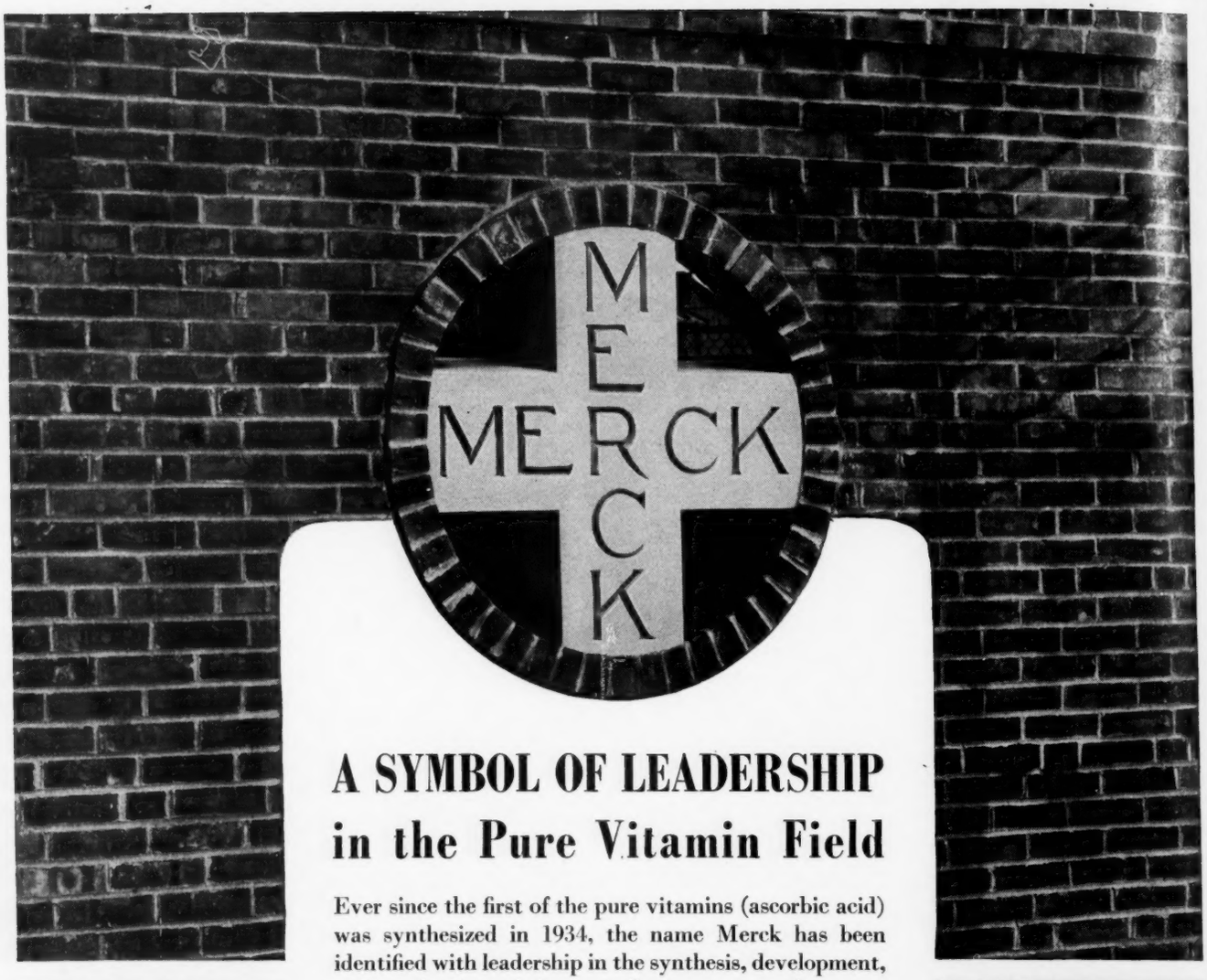
For information concerning the use of these chemicals, address:

CARBIDE AND CARBON CHEMICALS CORPORATION

Unit of Union Carbide and Carbon Corporation

30 East 42nd Street UCC **New York, N. Y.**

PRODUCERS OF SYNTHETIC ORGANIC CHEMICALS

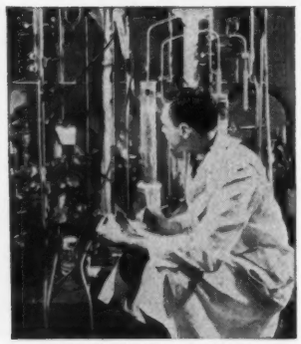


A SYMBOL OF LEADERSHIP in the Pure Vitamin Field

Ever since the first of the pure vitamins (ascorbic acid) was synthesized in 1934, the name Merck has been identified with leadership in the synthesis, development, and production of these vitally important substances.

The growing list of Merck contributions in this field emphasizes the outstanding rôle being played by Merck chemists and their collaborators in making available pure vitamins of known and uniform potency.

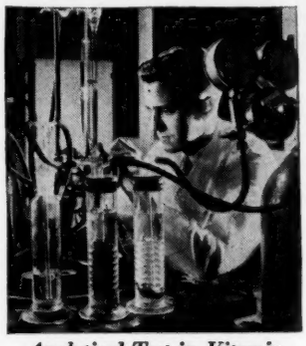
By using these pure chemicals of known and uniform potency, the proportions of the individual vitamins can be readily adjusted to meet the pharmaceutical manufacturer's specific product requirements. It is only through the use of these pure vitamins that the high dosages indicated in severe deficiency states can be provided.



Catalytic Synthesis in Vapor Phase

Chemical Assay of Vitamin B_1

Isolation of a Vitamin



Analytical Test in Vitamin Procedure

MERCK PURE VITAMINS

THIAMINE HYDROCHLORIDE U. S. P.
(Vitamin B_1 Hydrochloride)

RIBOFLAVIN
(Vitamin B_2)

NICOTINIC ACID U.S.P.
(Niacin)

NICOTINAMIDE
(Niacin Amide)

VITAMIN B_6 HYDROCHLORIDE
(Pyridoxine Hydrochloride)

CALCIUM PANTOTHENATE DEXTROROTATORY

ASCORBIC ACID U.S.P.
(Vitamin C)

VITAMIN K_1
(2-Methyl-3-Phytyl-1, 4-Naphthoquinone)

2-METHYL-NAPHTHOQUINONE
(Menadione)
(Vitamin K Active)

ALPHA-TOCOPHEROL
(Vitamin E)

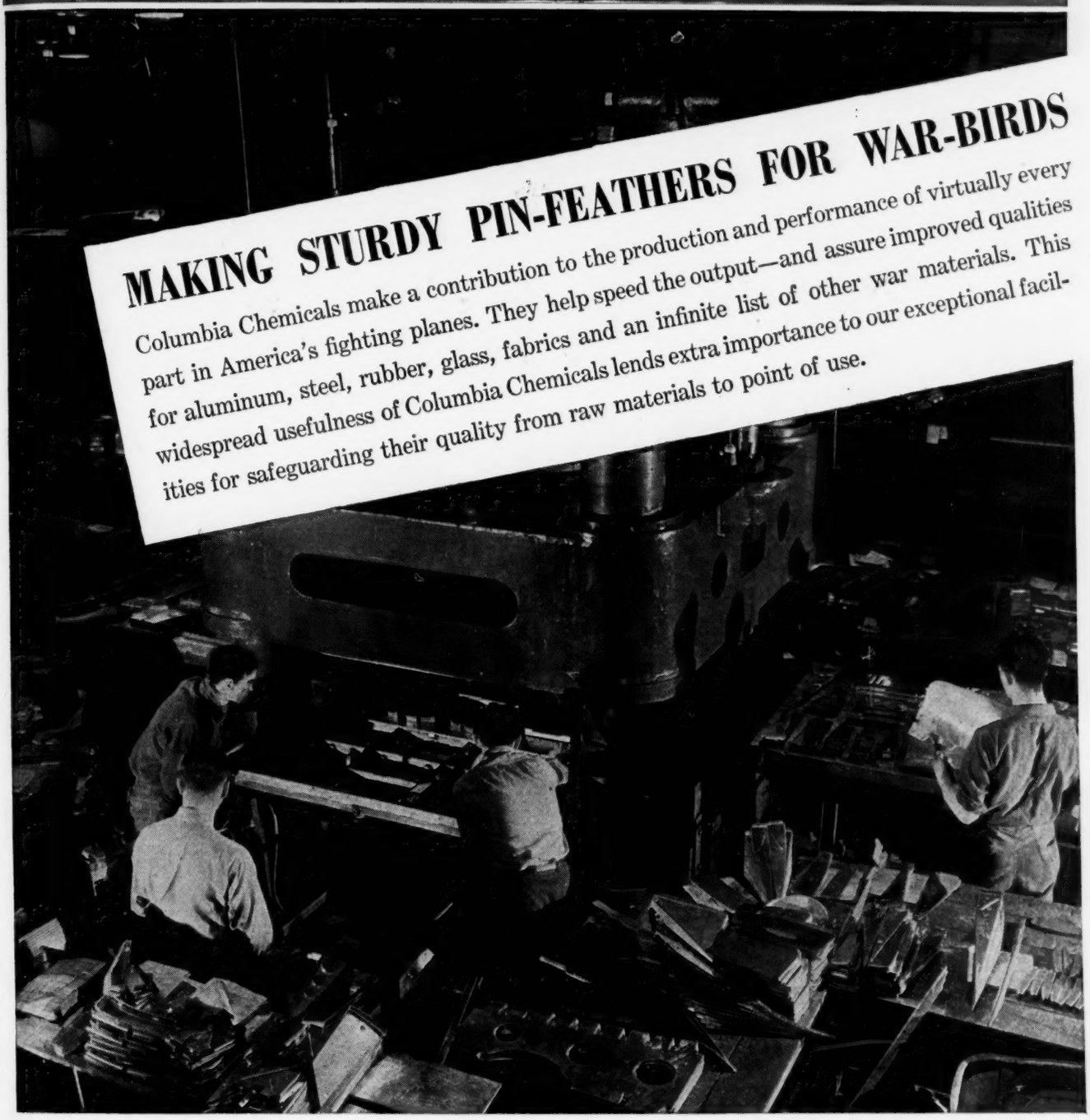
For Victory—Buy War Savings Bonds and Stamps

MERCK & CO. Inc. *Manufacturing Chemists* **RAHWAY, N. J.**

New York, N. Y. • Philadelphia, Pa. • St. Louis, Mo. • Elkton, Va. • Chicago, Ill. • Los Angeles, Cal.

In Canada: **MERCK & CO. Limited, Montreal and Toronto**

COLUMBIA CHEMICALS



MAKING STURDY PIN-FEATHERS FOR WAR-BIRDS

Columbia Chemicals make a contribution to the production and performance of virtually every part in America's fighting planes. They help speed the output—and assure improved qualities for aluminum, steel, rubber, glass, fabrics and an infinite list of other war materials. This widespread usefulness of Columbia Chemicals lends extra importance to our exceptional facilities for safeguarding their quality from raw materials to point of use.

ESSENTIAL INDUSTRIAL CHEMICALS

SODA ASH • CAUSTIC SODA • SODIUM BICARBONATE • LIQUID CHLORINE • SILENE* CALCIUM CHLORIDE • SODA BRIQUETTES MODIFIED SODAS • CAUSTIC ASH • PHOSFLAKE CALCENE** • CALCIUM HYPOCHLORITE

*Precipitated Calcium Silicate **Precipitated Calcium Carbonate

COLUMBIA CHEMICALS

PITTSBURGH PLATE GLASS COMPANY

COLUMBIA CHEMICAL DIVISION

30 ROCKEFELLER PLAZA, NEW YORK, N.Y.

CHICAGO • BOSTON • ST. LOUIS • PITTSBURGH • CINCINNATI

CLEVELAND • MINNEAPOLIS • PHILADELPHIA • CHARLOTTE

PURE MILK

ONLY 118,300,000 BACTERIA PER GLASS

If milk is improperly cooled at the farm or if milking machines and cans are not kept scrupulously clean, bacteria count rises alarmingly. Milk delivered to receiving stations with a bacteria count over 500,000 per cubic centimeter sours prematurely . . . is not worth pasteurizing!

Quick, positive check of the bacteria count is developed through the use of Methylene Blue in the Reductase Test. An aqueous solution of Methylene Blue colors good milk for 5½ hours. Not-so-good milk regains its whiteness sooner. If the "dyed" milk turns white within the hour, down the drain it goes!

Methylene Blue is one of many National dyes protecting America's health . . . another product of National Research — research that has expanded into the fields of Coating Resin Chemicals, Synthetic Detergents, Certified Food, Drug and Cosmetic Colors, Biological Stains and Indicators, Anti-Skinning Agents and other products.

NATIONAL ANILINE DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 RECTOR STREET **NEW YORK, N. Y.**

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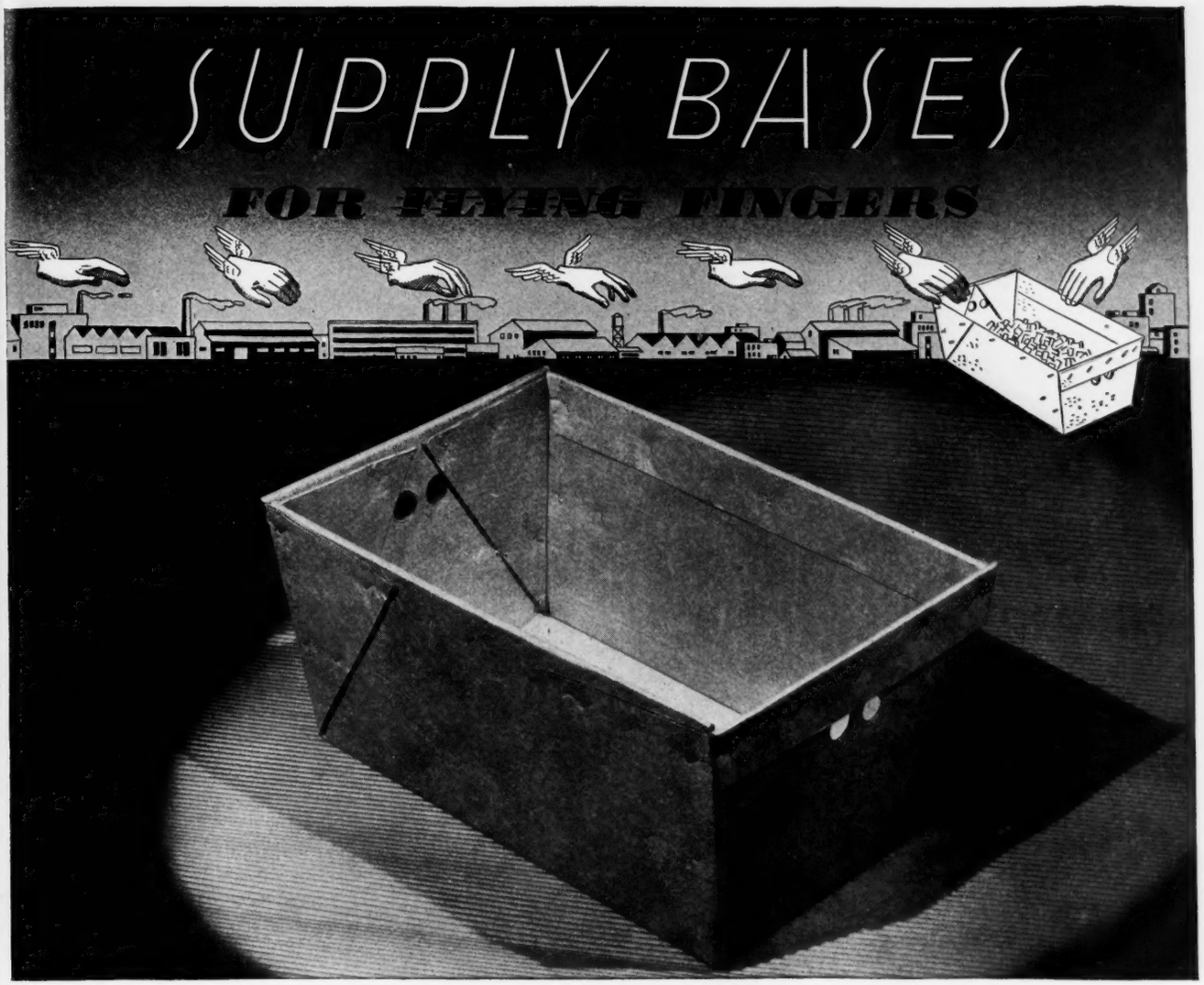
NEW ORLEANS	Masonic Temple Bldg.		
CHATTANOOGA	James Bldg.		
PORTLAND, ORE.	730 West Burnside		
TORONTO	137-145 Wellington St. W.		



H & D CORRUGATED TOTE BOXES
CONSERVE CRITICAL MATERIALS

In hundreds of war factories where vast quantities of small parts must be handled swiftly and accurately . . . where women workers make it imperative to check injuries and fatigue . . . where all critical materials must be released for production, H & D corrugated tote boxes are proving to be practical, efficient "speeder-uppers" for war schedules. Here's why:

Economical — constructed of inexpensive available materials, H & D corrugated tote boxes save you money in original costs.

Light Weight—easier to handle, they lessen worker fatigue, help reduce costly errors in handling small parts on production line or in storage.

No Hazards—flying fingers aren't ripped by jagged edges.

Adaptable to Many Jobs—available in many sizes, styles and sturdy shapes for an infinite number of production line, intra-plant haulage and storage operations.

Save Storage Space—delivered set-up and nested, as is the model illustrated . . . or flat for quick, easy set up.

Talk to your Production Line and Stock Room Men. Learn specifically how and where you can save money, materials and minutes with H & D corrugated tote boxes. You'll find the styles your men want in H & D's free bulletin "Tote Boxes." Write for your copy today.

BETTER SEE H&D *Authority on Packaging*

HINDE & DAUCH 4256 *DECATUR STREET, SANDUSKY, OHIO*

FACTORIES IN BALTIMORE • BOSTON • BUFFALO • CHICAGO • CLEVELAND • DETROIT • GLOUCESTER, N. J. • HOBOKEN
KANSAS CITY • LENOIR, N. C. • MONTREAL • MUNCIE • RICHMOND • ST. LOUIS • SANDUSKY, OHIO • TORONTO

RESEARCH

EVEN Pollyanna might have difficulty in finding a ray of sunshine in the situation in which many manufacturers have been placed because of present shortages of many materials. Nevertheless the resulting frenzied search for substitutes has often uncovered a hitherto overlooked product which has proven satisfactory or even superior to that formerly used.

Unfortunately, however, it has quite often been found that a new discovery is available in only limited amounts since the producer had not previously received sufficient encouragement to warrant installation of the equipment necessary for large-scale production. Even in such cases the research has not been in vain since with the return of normal conditions the producer will be able to supply the product in adequate amounts, the value of it having been established, and the user will have been awakened to the necessity of investigating all materials which he might use.

There is often a temptation to consider a particular product of manufacture as being entirely satisfactory as regards both quality and cost and to curtail research involving it. Because of present shortages of raw materials and equipment there is also a temptation to curtail research involving new products or new uses for present products.

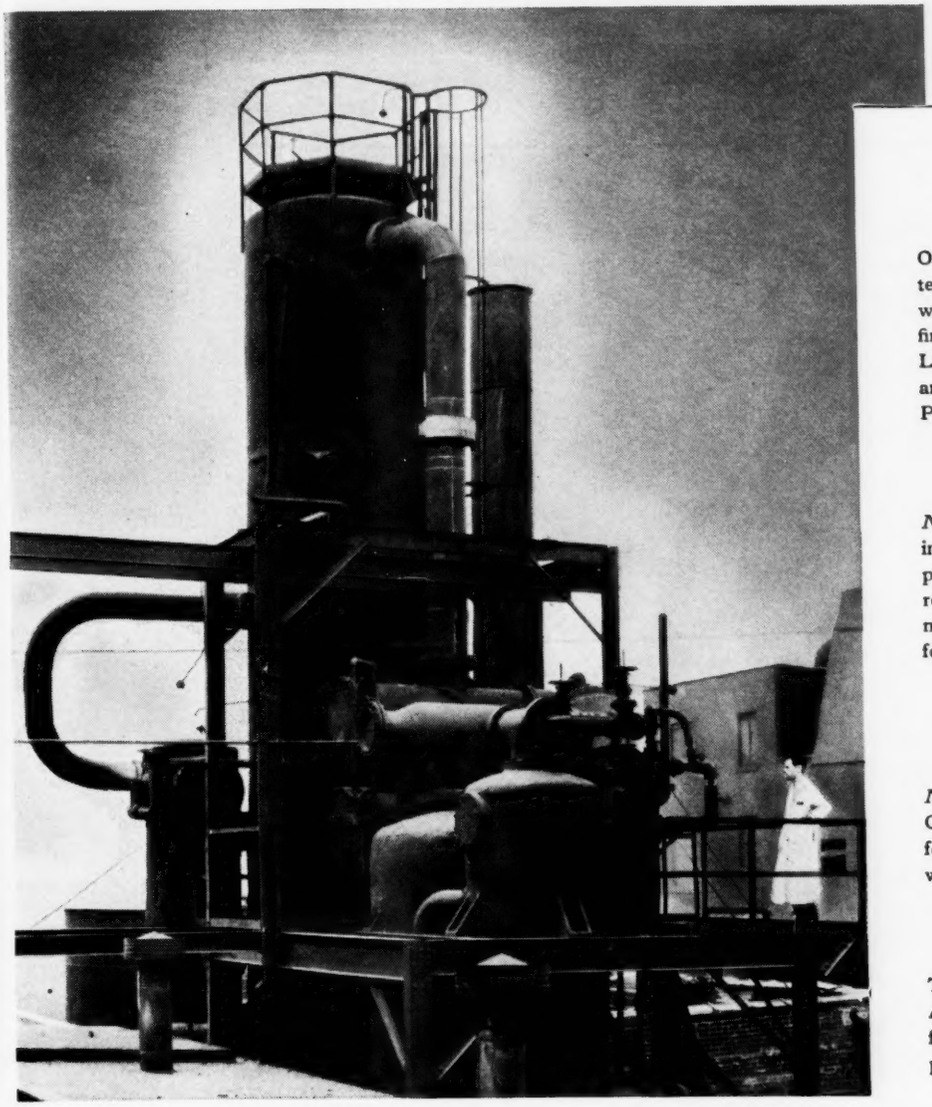
Chas. Pfizer & Co., Inc. does not subscribe to such views. We believe that when the job now in hand is successfully completed our nation will find itself with a productive capacity greatly in excess of any that it has previously enjoyed and that now is the time to prepare to utilize this. We are increasing our research program, primarily of course in order to help do our share toward finishing this present job as quickly as possible, but also secondarily that new products and new uses for old products may be available for any surplus productive capacity to come.

PFIZER QUALITY

MANUFACTURING CHEMISTS · ESTABLISHED 1849

CHAS. PFIZER & CO., INC.

81 MAIDEN LANE, NEW YORK · 444 W. GRAND AVE., CHICAGO, ILL.



NEW FATTY ACIDS . . . NEW SYNTHETIC OILS . . .

Developed for Today's Products and Tomorrow's Plans

Neo-Fats are answering vital production problems in many industries today.

And there is a specific Neo-Fat or group of them for each of the industries listed on this page.

These pure and mixed fatty acids and synthetic oils can adequately replace the imported and domestic oils no longer available.

They can be effective in making more standardized, uniform products of higher quality and better performance.

If your industry appears in the attached list, we invite you to explore the ways that Neo-Fats can improve your present products and serve in the development of new products still in the laboratory stage.

Write us for complete information and for samples.

ARMOUR AND COMPANY

Neo-Fat Division

1355 WEST 31ST STREET · CHICAGO

GREASE COMPOUNDING INDUSTRY

Our research on these products is centered on making available raw materials which assure improved stability in your finished greases. We recommend our Lub-base and animal fatty acids for soft and medium greases; and High Melting-Point Neo-Fats for hard greases.

ALKYD RESIN INDUSTRY

Neo-Fat D-142 is a new alkyd, embodying perfect performance in every vital property, and great economy. It is the result of today's specific alkyd requirements. There are other distilled Neo-Fats for every type of alkyd resin prepared today.

PAINT AND VARNISH INDUSTRY

Neo-Fat No. 170 and No. 190 Synthetic Oils have proved successful in many formulations where tung and oiticica oils were used previously.

CHEMICAL INDUSTRY

The availability of Neo-Fat Pure Fatty Acids has paved the way for the successful development of many new chemical products and compounds.

RUBBER INDUSTRY

We are prepared to supply fatty acids to your specifications, for use in compounding both natural and synthetic rubber.

SOAP INDUSTRY

There is a Neo-Fat available for virtually all types of soaps. In addition, we are equipped to prepare mixtures of fatty acids to your specific requirements. We also have facilities to split your oils.

COSMETIC INDUSTRY

The Neo-Fat line includes both pure and mixed fatty acids of high stability test for use in cosmetics.

NEO-FAT
U. S. REGISTERED TRADEMARK

ELEMENTAL *yellow* PHOSPHORUS

PHOSPHORUS of very high quality produced by electric-furnace reduction of phosphate rock from our own mines. Our Yellow Phosphorus with its high standard of purity is characteristic of the careful preparation of PM products for 37 years.

OTHER ELECTRIC-FURNACE PRODUCTS

PHOSPHORIC ACID 75%—Pure Food and Technical grades.

"ELECTROPHOS"—A superior quality of triple superphosphate containing over 48% P_2O_5.

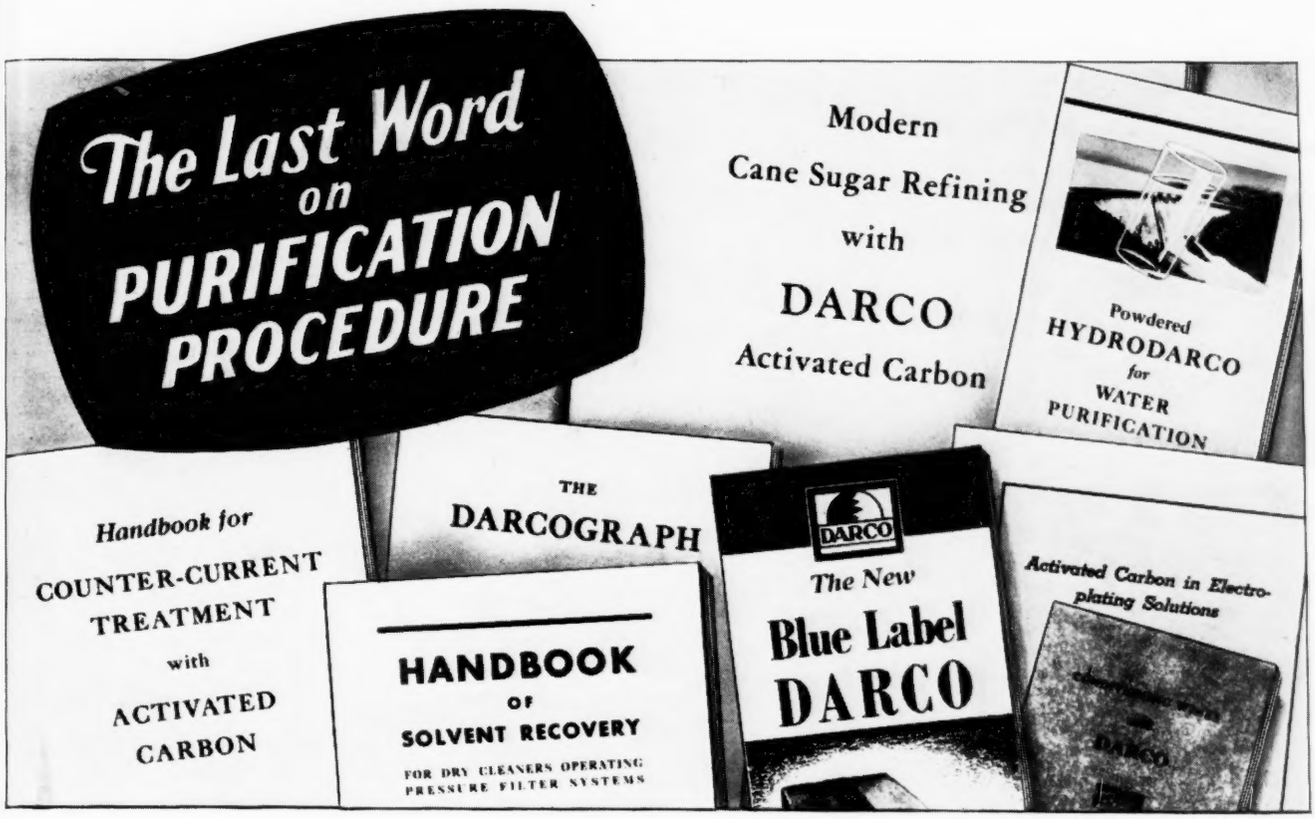
FERROPHOSPHORUS—A high-analysis compound of 24% to 26% phosphorus content.

Our experience in phosphates "from the ground up" includes, in addition to the manufacture of phosphate chemicals, the mining of millions of tons of Florida Pebble Phosphate Rock. If you have special requirements for quality, calcining or grinding, let us confer with you. We meet many particular specifications.

THE PHOSPHATE MINING CO.

110 WILLIAM STREET, NEW YORK, N. Y. • NICHOLS, FLORIDA

An activated aid to processing **DARCO** REG. U.S. PAT. OFF. An active aid for purity specifications


The Last Word on PURIFICATION PROCEDURE
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Powdered HYDRODARCO for WATER PURIFICATION
Handbook for COUNTER-CURRENT TREATMENT with ACTIVATED CARBON
THE DARCOGRAPH
HANDBOOK OF SOLVENT RECOVERY
FOR DRY CLEANERS OPERATING PRESSURE FILTER SYSTEMS
DARCO
The New Blue Label DARCO
Activated Carbon in Electro-plating Solutions
DARCO

Darco's series of booklets and folders contains useful, up-to-date information for your technical staff—practical pointers on activated carbon

If you want practical, useful advice and suggestions on how to solve the purification problems so important in chemical industries today—look in the folders and booklets issued by Darco.

Darco has no catalog, because each application is a problem in itself, deserving and getting individual attention. The various Darco booklets are primarily devoted to effective methods of using activated carbon. You'll find no "ballyhoo," no fancy pictures in these booklets—just solid, down-to-earth information that your technical people can use to improve your product's quality, and perhaps cut production costs as well. With the data in these booklets, and through coöperation with Darco representatives, many chemical plants have learned how to eliminate troublesome odors and colors—to produce brighter, whiter crystals—to arrive at minimum processing costs.

We will be glad to place your technical staff on our mailing list, and to send immediately a copy of the booklet dealing with your particular field.

DARCO Reg U. S. Pat. Off.

DARCO

DARCO CORPORATION

60 East 42nd Street, New York, N. Y.

Westvaco
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Westvaco
CHEMICALS

Westvaco
CHEMICALS

Streamlined for Service
TO THE CHEMICAL INDUSTRY

TO SIMPLIFY and co-ordinate internal operating procedures, and
TO CONSOLIDATE technical and sales operations, and thereby
TO RENDER BETTER SERVICE to our Government and Industry

Effective July 1, 1942

the production, technical and sales operations of
WARNER CHEMICAL COMPANY DIVISION
CALIFORNIA CHEMICAL COMPANY DIVISION
THE MAGNESOL COMPANY DIVISION
NATIONAL KELLASTONE COMPANY DIVISION
will be integrated into

WESTVACO CHLORINE PRODUCTS CORPORATION

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These are Westvaco Chemicals

ALKALIS
Caustic Soda
Caustic Potash

CHLORINE and SOLVENTS
Chlorine, Liquid
Carbon Tetrachloride
Trichlorethylene
Perchlorethylene
Carbon Bisulfide
Sulfur Chloride

PHOSPHATES
Phosphoric Acid
Sodium Phosphates
(mono, di- and tri-basic)
Tetra Sodium Pyrophosphate
Acid Sodium Pyrophosphate

MAGNESIUM PRODUCTS
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Magnesium Oxide, Refractory
Magnesium Hydrate
Magnesium Chloride
Magnesium Silicate

BARIUM PRODUCTS*
Barium Oxide
Barium Carbonate
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Chemical Gypsum
Ethylene Dibromide
Epsom Salts
Hydrated Lime
Hydrogen Peroxide
Quick Lime
Sodium Sulfide
Sodium Hypochlorite
Magnesol (*TM Reg.*)

**Produced by Barium Products, Ltd.*

HE NEEDS A DOZEN UNIFORMS... FAST!

How du Pont Research Speeds War Production

IT'S NO EXAGGERATION to say that a modern soldier needs a dozen uniforms. It's an understatement! An army of one million men requires as much cloth of all types as do 15 to 20 million civilians. And the army needs that cloth—*fast.*

Du Pont is helping to get uniforms for our Army and Navy with all speed. Of the millions of yards of cloth required, for instance, a tremendous amount must be bleached before dyeing. And out of du Pont research has come the greatest advance in bleaching in almost a hundred years. A new continuous bleach using du Pont peroxides changes grays to full white in 130 minutes compared with 8 to 14 hours for ordinary bleaching operations -- saves time, power and chemicals. It's *fast!*

Again, in removing spinning oils and dirt from woolen piece goods, a du Pont solvent applied in a continuous process replaces lengthy washing with soap and water. Thousands of yards of woolens are degreased at the rate of a mile an hour — enough for ten uniforms every minute. That's *fast!* And the valuable oil can be saved for re-use.

To furnish dyes for uniforms, du Pont production of vat colors for military use has been increased 500% in the past three years and will be increased again this summer. Almost the entire output of these particular vat dyes was going into military goods by the end of 1941. Du Pont is now supplying more than half of all the anthraquinone vat dyes used in cotton uniforms and about 30% of all dyes for wool uniforms. This peak production has been reached with unparalleled speed. *Fast!*

These and other du Pont developments and products have contributed materially to 'dressing' our growing Army and Navy—*fast!*

* * *

Behind all these contributions stands the du Pont Technical Service man. He is backed by 140 years of service to industry... 140 years of experience in solving difficult problems. Call on him when you need help.

DU PONT
REG. U. S. PAT. OFF.

E. I. DU PONT DE NEMOURS & CO., (INC.) **WILMINGTON, DELAWARE**

TAM Zircon crucibles are finding wide application for various high temperature applications up to 3500° in non-ferrous melting such as aluminum, platinum, etc. These Zircon crucibles not only resist various acid and alloy reactions, but due to the straight line expansion coefficient of Zircon, exhibit exceptional good heat shock properties. Refractory bonds consisting of other compounds are not necessary in the manufacture of TAM Zircon crucibles thereby assuring the user of a pure Zircon product.

TAM small crucibles and shapes of semi-vitreous Zirconium oxide are manufactured for use in quartz fusions and high temperature applications up to 4500° F.

An experienced staff of field engineers, located in various parts of the country, are available for consultations without obligation. Write.

TAM PRODUCTS INCLUDE

Zircon bricks, special shapes and crucibles... Zircon insulating refractories... Zircon ramming mixes, cements and grog... Zircon milled and granular... Electrically Fused Zirconium Oxide Refractories... Electrically Fused Zirconium Oxide cements and ramming mixes... Electrically Fused Zirconium Oxide in various mesh sizes.

T.A.M. ZIRCONIUM TITANIUM PRODUCTS
Registered U. S. Pat. Off.

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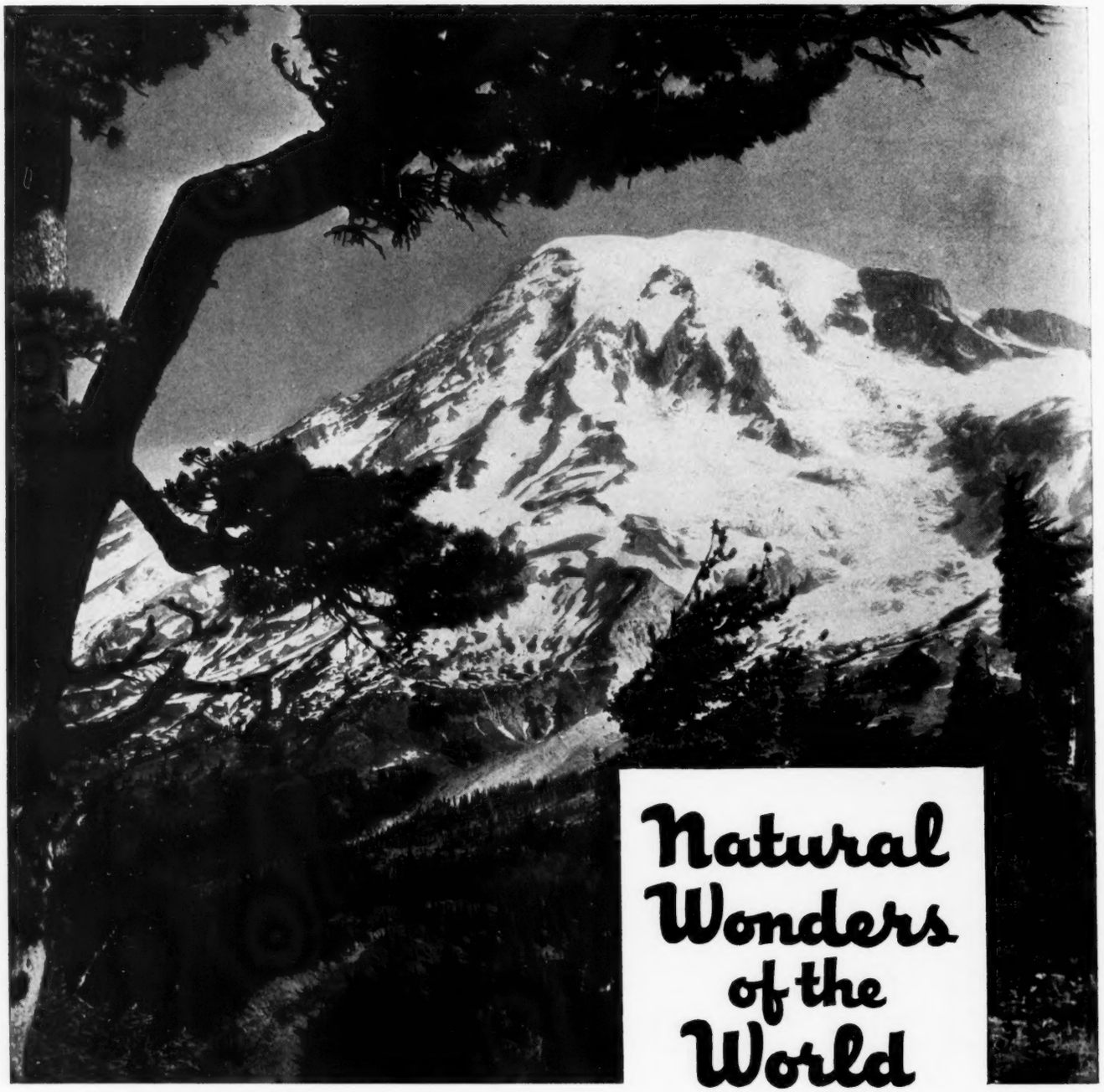
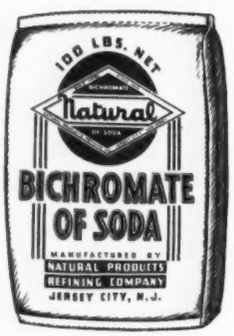




Undisturbed by human conflict Mount Ranier lifts its perpetually snow-clad summit skyward, an inspiring example of Nature's steadfastness and might.

Natural Bichromates, too, remain the same in peace or war without compromise of quality. "Natural" on bag or barrel is your guarantee of purity, uniformity and full weight.

NATURAL PRODUCTS REFINING CO.
904 GARFIELD AVENUE JERSEY CITY, N. J.

Natural BICHROMATE

The Emphasis Is Now On Salvage

EDITORIAL

Walter J. Murphy, Editor

Industry as a whole can well be proud of its record of achievements of the last six months, but frankly no matter how much is produced, no matter how far we outstrip the Axis, there still exists a real necessity for producing more and still more of the sinews of war. How long the war lasts is likely to be pretty much in direct proportion to the volume of war materials we are able to turn out quickly. Indeed the war may be lost if we fail to move with the utmost speed and dispatch. Our enemies have had eight to ten years start on us and at the moment Germany and Japan are at the peak of their production possibilities. It is against such tremendous odds that our armed forces are battling the world over.

Our present rates of production of planes, ships, tanks, guns, explosives, etc., high though they may be, must be increased still further and a large part of the raw materials required in such an enlarged output must come from the scrap piles of America. In the seven months that have passed since Pearl Harbor the War Production Board has been able to supply the war industries with large tonnages of essential materials by resorting to the relatively simple expedient of closing down on manufacturing operations on civilian goods but in many instances that reservoir is now practically dry. Hence the emphasis now is on salvage. Donald Nelson is authority for the statement that the supply of raw materials has become the chief problem facing WPB.

War and civilian industries are faced with shortages of varying intensity of every essential material except the following: asbestos, asphalt, brick and tile, clay, coal, coke, ceramics, concrete, cotton, feldspar, glass, gold, mineral wool, plywood, lignin, limestone, marble, wallboard, wood products, salt, silver, slate and sulfur.

Our need for copper is so great it will be necessary to melt down name-plates, statues and bronze bank doors. Our steel production program is being endangered by an alarming lack of sufficient scrap. Already an experiment is in progress in Chicago in collecting fats and grease from homes in an effort to assure us of greater supplies of glycerine. The stark necessity of recovering every available piece of rubber was the subject of a radio talk a few weeks back by the President, and it is a sad commentary on that effort to report that the results of the initial drive were very disappointing to say the least.

There must be placed in operation at once a tremendous effort to speed the flow of secondary materials into the channels of war production. This can not be undertaken in a haphazard fashion. It calls for an intelligent well-thought-out program, enthusiastically backed by industry and the people of this country. Such an effort should call for: wrecking abandoned, obsolete machinery and equipment; utilization of critical materials to the very best advantage; minimum waste and spoilage; re-use where possible of all critical materials; quick return of all scrap to the war effort through commercial agencies equipped to handle such products. As to the householder he or she must be impressed with the vital part that every tin can, every piece of rubber, every rag plays in speeding the output of war material.

In the chemical field much has already been accomplished through the efforts of the Chemical Branch of the WPB in arranging for the recovery of important solvents in plants equipped with solvent recovery units. This is a fair start but it is only just a beginning. Top executives in all industries busy though they are must make certain that the necessary arrangements have been made in their plants to reclaim every ounce of material that will help to bring ultimate victory to the United Nations. In the past we have not been sufficiently concerned with utilizing wastes. Now there can be no excuse for not doing so.

Replacing Manpower: All indications point to the fact that a number of chemical companies are giving very little if any thought to formulating plans for replacing men of draft age with older men and with women. Such companies, literally emulating the ostrich, are going to find themselves out on the proverbial "end of a limb" very shortly. Executives should remember that the draft age is now between the years of twenty and forty-five and before very long it is likely that young men of eighteen years of age will be subject to call to the colors. There are a great many important key men under forty-five in the chemical industries and a number of these unquestionably will be drafted in the very near future.

It is becoming increasingly difficult to obtain occupational deferments before local draft boards. They in turn are being pressed to meet ever-increasing quotas from the army. A very severe bottleneck in manpower is coming very shortly and the entire matter is one of simple arithmetic. Even an army of five million men means some fifty million engaged behind the lines in production, assuming a ratio of one to ten, and a great many authorities insist that the ratio actually is very much higher, even one to seventeen. Obviously no matter what the real ratio is the time has arrived to formulate plans for training men above the forty-five age limit and women for just as many jobs as possible.

There has been too much wishful thinking that we possess an unlimited supply of manpower in this country. Actually for the work that has been cut out for us to do we have no surplus and unless the war ends suddenly we will face a very serious deficit. The chemical industries of England and Germany have been employing women in many jobs and under the circumstances the results have been quite satisfactory. Nor does it look now as though the war will end in 1943. The safest plan is to assume that we face at least five years of bitter struggle and to plan accordingly.

Transportation for Workers: Transportation of chemical plant personnel to and from work is a matter that should be given immediate consideration by management. Because of their very nature most chemical plants are located at considerable distances from urban centers and no matter what optimistic statements are made by certain individuals appearing before congressional committees the outlook on rubber is not a bright one. We will be extremely fortunate if the government is not forced to take much of the rubber that is now being burned up on the highways of America.

Plans have been made to handle the transportation problem of essential war workers. State committees have been formed and the chairmen of these state committees have been appointed state coordinators. Mayors of cities with populations of 10,000 and over have been requested to appoint local committees to facilitate the work of planning.

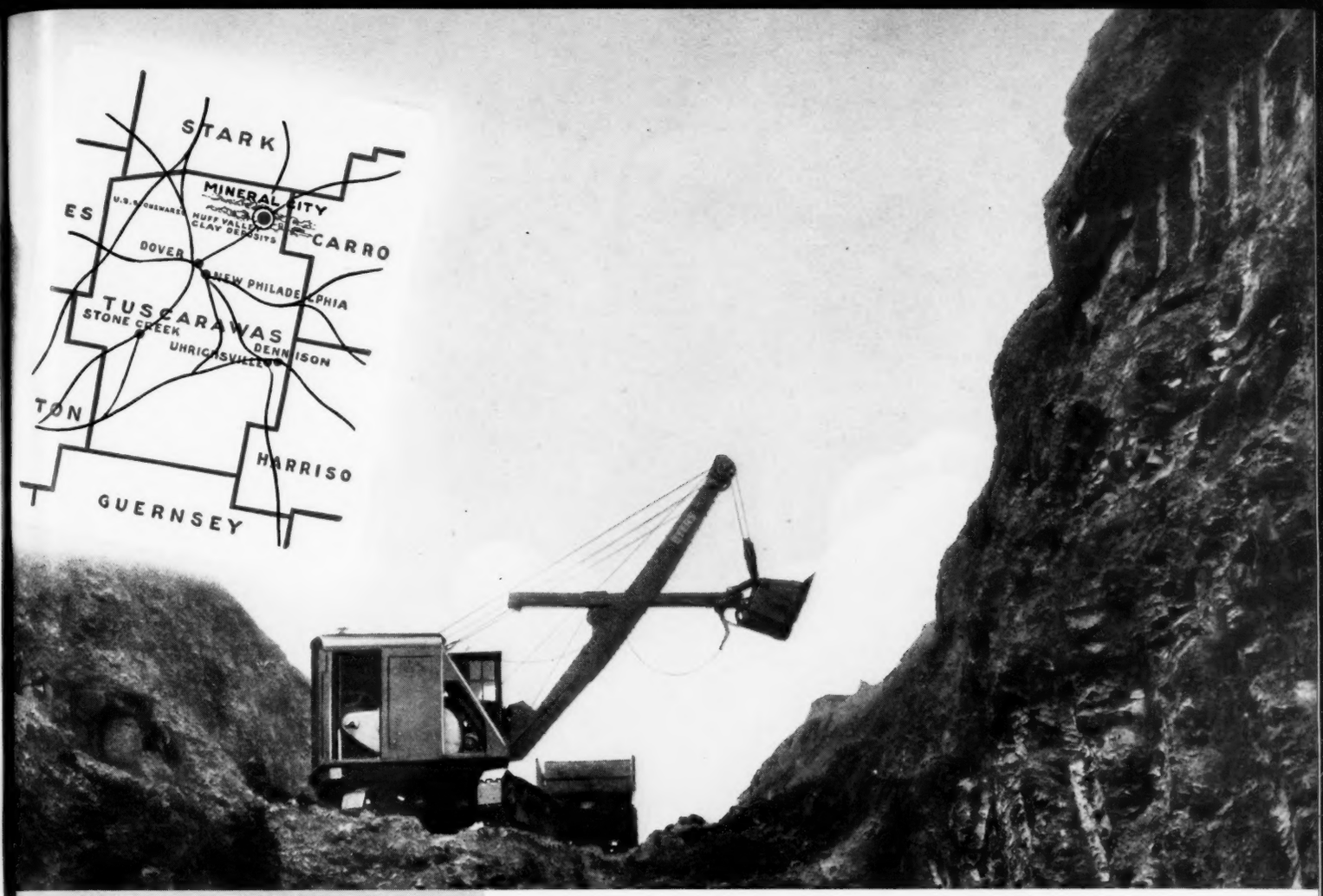
A number of plants scattered over the country have done outstanding work in arranging for group riding of workers. In some factories labor-management committees have prepared maps showing where each employee resides and this has helped materially in making the necessary arrangements. A very well-known airplane factory has been able to increase car occupancy ratio from 2.6 to 4.1. In certain instances staggering the hours of work has improved transportation and avoided crowding of busses, etc.

There is the question of liability where private car owners act in the capacity of common carriers but a movement is under way to provide special type policies that will give adequate protection. Those who want additional information on the general subject of transportation of workers should write directly to J. Trueman Thompson, Office of War Transportation, Washington, D.C. He is directly concerned with the pooling of passenger cars in serving industrial plants.

Packaging in War: Those attending the meeting of the National Association of Insecticide & Disinfectant Manufacturers in Chicago last month could not help but be impressed with the changes reported in packaging that an all-out war effort is forcing on manufacturers of both bulk chemicals and household and industrial chemical specialties.

Conditions serious as they are now, are nothing to what is yet likely to happen over the next few months. Manufacturers of containers of various types have performed wonders in providing a number of substitutes and in some instances the substitute has been found to be better than the original. One angle of the present situation may have a lasting beneficial effect—standardization, and probably only a war could bring about such an over-all sweeping revision and elimination of too many sizes and shapes.

Manufacturers attending were warned that much of the steel now going into containers must be relinquished soon. Right now is the time to give serious attention to a detailed study of the packaging problem and specially to look into the relative properties of materials for packaging which now appear to be the least likely to be affected by demands from war industries. Steel for ships, steel for the erection of synthetic rubber plants will leave very little for use in the manufacture of containers except where no other material is available that will prove even half-way satisfactory. To be forewarned as were N. A. I. D. M. members by packaging experts of the government and private industry, is to be forearmed. Others in the chemical field will find considerable information on the subject of war time packaging in the report of meeting published in this issue.



"U.S." Chemical Stoneware bodies are permanently inert to the action of all corrosives, with the exception of hydrofluoric acid and hot caustics. They will not contaminate or "poison" any solution nor affect the most delicate flavor or fragile color.

"U.S." Chemical Stoneware is permanently leak-proof and trouble-proof. The salt glazed surfaces are easily flushed clean. Neither the body nor glaze can peel, flake, craze, or stain. The surface cannot become slimy, nor the body absorb odors.

"U.S." Chemical Stoneware can be made into any shape. Unusual designs in one piece, without joints or welds, can usually be made at costs substantially below that of equipment fabricated from any other material.

●

As a manufacturer of corrosion-resistant equipment from natural rubber, synthetics, alloys and ceramics, we are in a position to offer an unbiased opinion as to the relative worth of any corrosion-resistant material for a specific purpose. Please feel free to write, without obligation, about any phase of your operations which involves corrosion.

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America's Oldest and Largest Manufacturers of
CHEMICAL STONEWARE

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THAT portion of the good earth suitable for the exacting requirements of fine chemical stoneware is not widely distributed. Even clays taken from the same source differ considerably in chemical and physical characteristics. "Pockets" of perfect clay are often found side by side with clays of inferior quality. Thus, clays purchased promiscuously in the open market rarely possess all of the qualities essential to produce good chemical stoneware. Frequently, they contain a dangerous and variable percentage of undesirable elements. Uniformity of product is, therefore, difficult if not impossible to achieve.

U.S. Stoneware alone, of the manufacturers of chemical stoneware, owns and operates its own clay mines . . . located in the heart of an area recognized by geologists as rich in clays unexcelled for chemical stoneware purposes.

To mine the deep veins (where the purest clays are found) with modern high speed production methods, and yet retain the ability to "hand-pick" the most desirable clays, "U.S." mining engineers developed a new and unique method of mining — utilizing small, flexible machines in deep, narrow cuts.

It is this exact control of the sources of its basic raw material that accounts in a large measure for the uniform excellence of U.S. Chemical Stoneware. To be sure of unvarying quality — always specify "U.S." Chemical Stoneware. There is no "or equal."

U. S. *Stoneware*

AKRON • OHIO

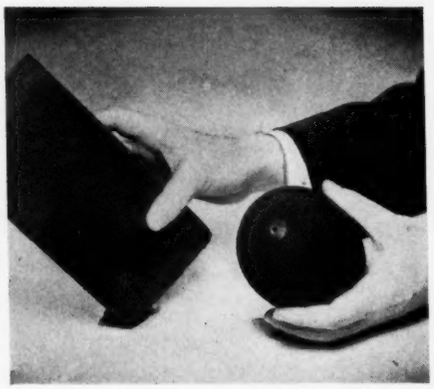
ENGINEERS, MANUFACTURERS, ERECTORS of CORROSION RESISTANT EQUIPMENT

Glass Goes to War

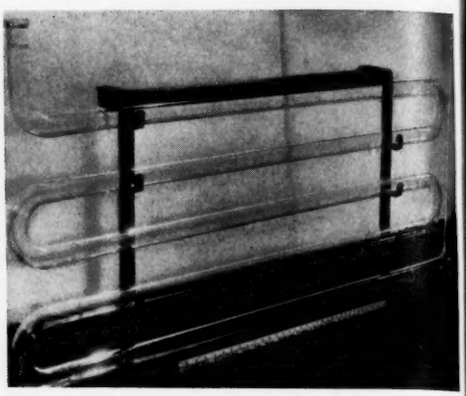
By T. J. Thompson*

Glass, as versatile as it is vital, discloses an ever-expanding list of uses. This article on its work in war was first presented as a paper before the American Ceramic Society

*Manager, Industrial Division Corning Glass Works



"Foamglas" insulating brick and ball float with threaded plastics insert.



Glass cooling coil made with new, fast electrical welding methods.

ONE of the best cavalry generals that ever straddled a horse was a confederate rebel by the name of Forrest. He was a back-woodsman and didn't know much about grammar. But, he did know how to win battles. Also, he knew how to express himself simply and succinctly. General Forrest ascribed his success to one basic tactic which, in his own words, was "Git thar fustest with the mostest men". Today that precept must be modified somewhat; it could read "git thar fustest with the mostest fire power". The men in our armed forces who will control and direct that fire power are anxiously awaiting delivery of it to them in Australia and elsewhere, and it is our common hope and aim that the expression "too little and too late" will shortly vanish from the reports of courageous but ill-equipped generals and admirals of the allied forces. In the creation of that fire power, the glass industry is playing an important part, not only as a means for releasing other more critically needed materials for war purposes, but directly in the war industries as an important and unique material of construction.

During the 28 years since the opening of hostilities in World War I, glass has made an increasingly important place for itself, both in industry and in the home. Perhaps the most important single milestone in its progress during that period was the development of hard boro-silicate glasses by Sullivan and Taylor[1] in 1914. These glasses constituted a long step forward in the search for glass having the high-

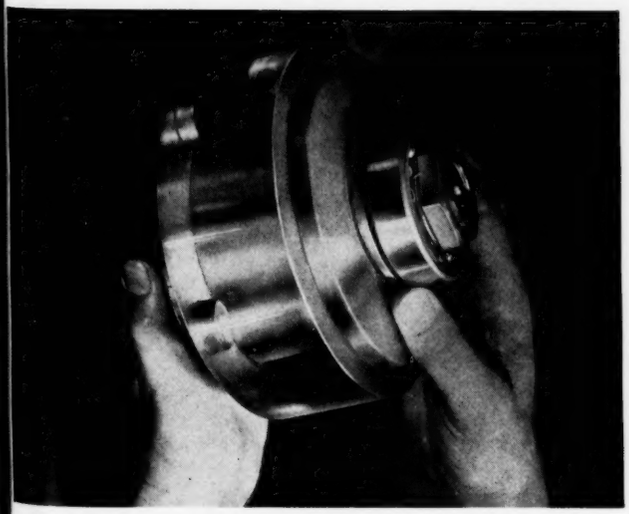
Floats made by sealing two pressed halves together with accurate center groove for metal band. (Corning Glass Photo)

Glass spray nozzle for corrosive solutions. (Corning Photo)

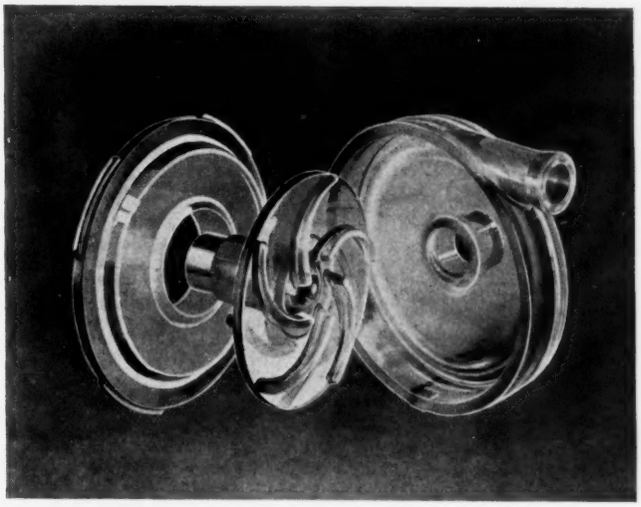
Pyrex piping (2″ I. D.) for pressures up to 100 pounds per square inch.

ly desirable properties of quartz, the perfect glass, but which, in contrast with quartz, could be readily melted and formed into usable shapes. Their remarkable combination of heat and chemical resistance, coupled with excellent mechanical and dielectric properties instantly opened the gates to broad new fields of useful applications. Stemming from this important discovery of Sullivan and Taylor and stimulated by it, research and development work of ever-broadening scope has pried loose a flood of new knowledge of glass and its properties, and the practical ways to utilize them to enhance our way of life.

Another major milestone was the subsequent discovery of ways and means of doubling or tripling the mechanical strength of glass and, at the



Precision-finished glass roller firmly bonded to metal hub-equipped with ball bearings. (CG photo)



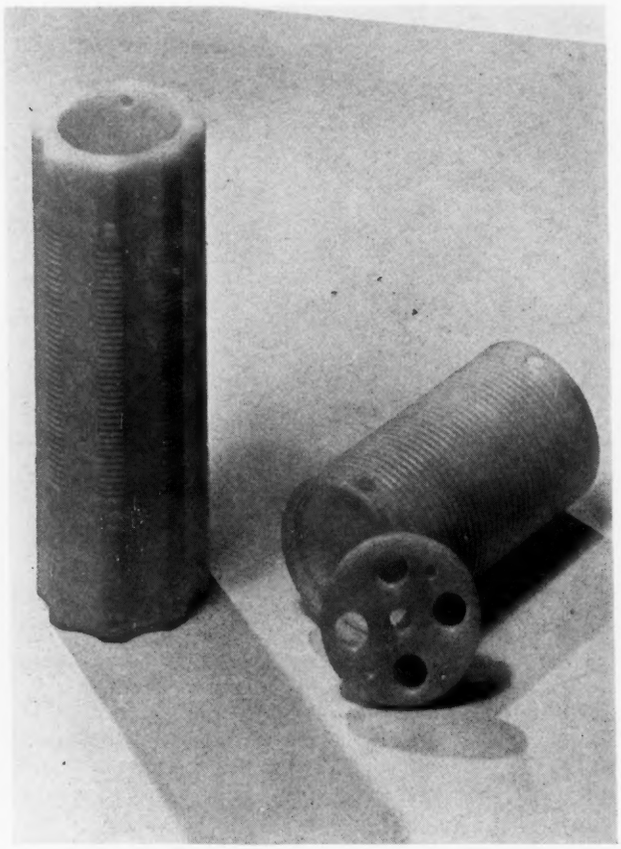
Newly-perfected glass pump with casing, impeller and back plate, of pyrex. Impeller has static and dynamic balance.

same time, improving still further its resistance to heat-shock by "tempering" or "heat processing". A well known example of ware so treated is "Pyrex" Flameware for use over open flame or electric range heating elements; another is the tempered plate glass which is just now coming into common use as all-glass doors in store-fronts.

More recently, the remaining gap between glass and quartz has been nearly closed by the development of 96 per cent silica glass by Hood and Nordberg.[2] Their new process not only makes possible the commercial production of quartz-like ware with conventional glass-forming methods, but also permits use of the old ceramic art of "slip-casting" to make this unique glassware available in sizes and shapes and intricacy of pattern previously impossible of attainment in glass. The new tool thus made available to industry is still in infancy, but the scope of its usefulness broadens almost daily.

To the glass section of the ceramic industry, these developments are by now an old and familiar story of which it may be justly proud; but, despite the great strides which have been made in the utilization of glass, there is astonishingly little sound knowledge of its properties and potentialities among the scientific, engineering and business fraternities, to say nothing of the general public. Perhaps this is because many important glass applications are highly specialized and, therefore, hidden from public view. It is advisable to bring to light some of the little known applications of glass of long standing which have new and important significance now; and secondly, to report on those new developments about which we can talk without giving "aid and comfort to the enemy". As regards the latter, there is actually little to fear because the Nazi government in Germany has for many years forced wide-scale adoption of glass by industry and the public in anticipation of the metal shortage to follow upon declaration of war. We know, for instance, that glass piping has been widely used there, not only in the chemical industry, but in the dairy and food products industry and for domestic plumbing. This wide-scale use has resulted in the creation of a new trade or craft called "glass-plumbing". Frankly, we would like very much to know just how far Germany has gone in the use of glass in the "Ersatz program".

Accessories for joints, new-type sanitary glass pipe.



Glass coil forms and end plates for ultra H. F. radio.

Chemical Industry Glass Piping

One of the earliest and most obviously useful industrial applications of the heat and chemical resistance of boro-silicate glassware was for piping hot, corrosive solutions in the rapidly expanding American chemical industry. It is more than 16 years since the first crude glass piping was installed. Some of those old installations are still in operation and are, by now, literally worth their weight in gold because of the elimination of costly and frequent replacements of previously used metals and alloys. But, even the chemical industry, with its outstanding record of progressiveness, was for many years reluctant to adopt glass piping because of fear of breakage in its rough and tumble operations using unskilled help. In many instances, initial installations were made in sheer desperation after all else had failed to solve troublesome corrosion problems. But, bit by bit, initial installations were enlarged and new ones added when the early pioneers found that their fears were unwarranted and that the glass equipment could be safely handled by untrained workmen. In fact, it was often found that workmen who were accustomed to using slam-bang methods treated the glass equipment with great respect because it was obviously glass; quite often they take inordinate pride in their ability to install and use glass without breakage. Sometimes their pride is justified as in the case of a

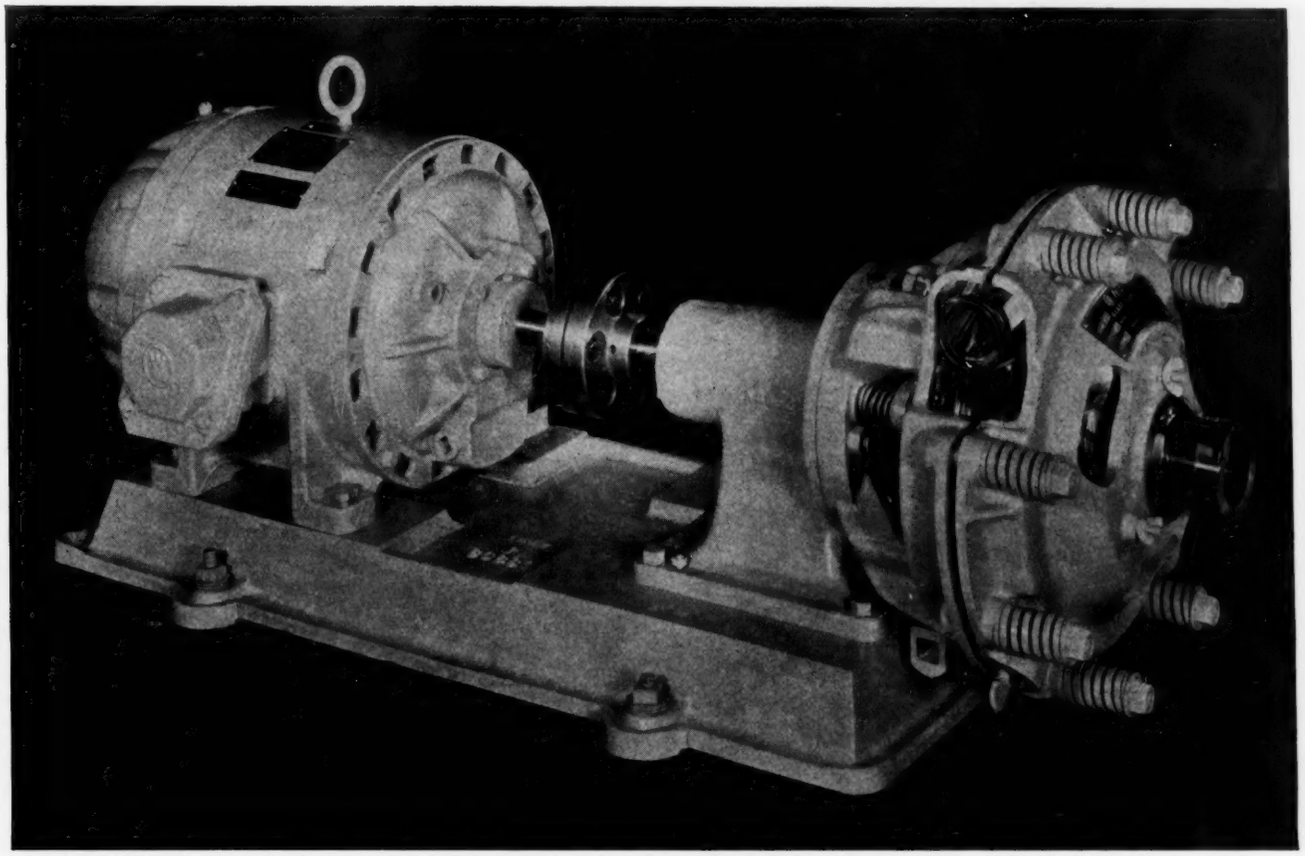
new plant, which, several years ago, started from scratch with a "green" construction crew recruited from nearby farms. Several thousand feet of glass piping, some of it complex, was installed without breaking a single piece.

Many users of the piping reaped an unexpected dividend; not only did they solve their corrosion problems, but they also improved their control of product quality by elimination of metallic contamination from the pipeline; also they found that trouble can't hide behind transparent glass.

As time went on, there followed a succession of improvements in design of piping and fittings and fabrication methods until today, breakage no longer holds any fear for experienced users of it. Every major producer of chemicals in this country and many of the smaller ones now use it in substantial quantities for conveying, heating, cooling and absorption of a myriad variety of corrosive liquids or gases, many of which are vitally essential to the production of explosives, poison-gases, high-octane airplane fuels, magnesium and other materials of war. Manufacturers of drugs, pharmaceuticals, reagent chemicals, vitamins and biological compounds also have serious corrosion problems, but are mostly concerned about the purity of their products. In many instances, glass equipment has proved to be the answer to both problems.

Food Industry

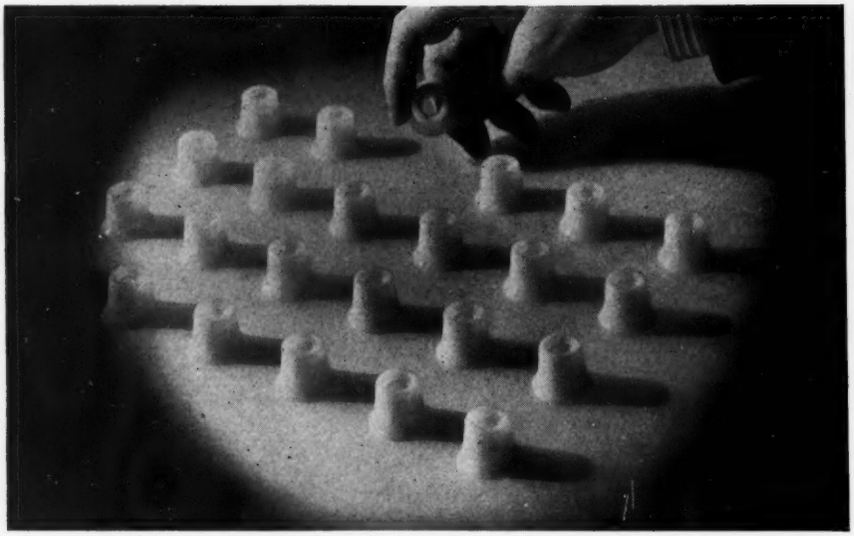
More recently, the food and beverage industries have learned the advantages of glass piping, particularly those large groups working with acidic products such as tomatoes, fruit juices, vinegar, pickling brines and organic acids as well as phosphoric and sulfurous acids. Important as the corrosion problem is in the handling of such fluids, an even more difficult problem is the maintenance of sanitation. Fortunately, the "glass smoothness" of glass piping makes it easier to clean than almost any other material. Simple flushing of pipe lines with cold and hot water or cleansing agents followed by sterilization with steam or sterilizing solutions enables the operator to maintain close control of the bacteria count in his product. For reasons not too well understood but probably because of its non-crystalline structure, glass is very reluctant to take and hold films of impurities and undesirable scale; and no pits in which bacteria can hide can form by corrosion. Furthermore, the transparency of glass is not the least of its merits because instant inspection of interior surfaces of pipe walls leaves nothing to the imagination of the workman or his supervisor. Stainless steel and aluminum, formerly considered indispensable for food service, are thus released to the armament factories in substantial quantities. Illustrations show the simple strong joint construction of piping suitable for working pressures up to 100 pounds per square inch; thin-walled piping and fittings are readily assembled to make strong jacket-type heat exchanger equipment, suitable for the heating or cooling of the most corrosive of liquids or gases as well as the most sensitive foods or drugs.



Assembly view of 1½" x 2" Nash pump having glass parts. Capacity of this motor, common to the chemical industry, is 100 g. p. m. at 65 ft. head.

Electrical Welding of Glass

The latest innovation in glass piping is the electric welding of joints in the field to eliminate or reduce the number of joints. By means of portable equipment generating suitable high frequency currents, the tube ends can be quickly welded together in place and subsequently annealed in short order. Figure four shows a piping assembly being made in this manner. This new development will undoubtedly find widescale application in the chemical industry, where it will eliminate almost



Glass rollers made by Corning for the rayon industry. Because they often run fast in acid liquor, they must resist abrasion, corrosion and scaling.

entirely the troubles resulting from flanges and gaskets and at the same time minimize or prevent leakage of corrosive gases or liquids and the resultant damage to buildings and equipment.

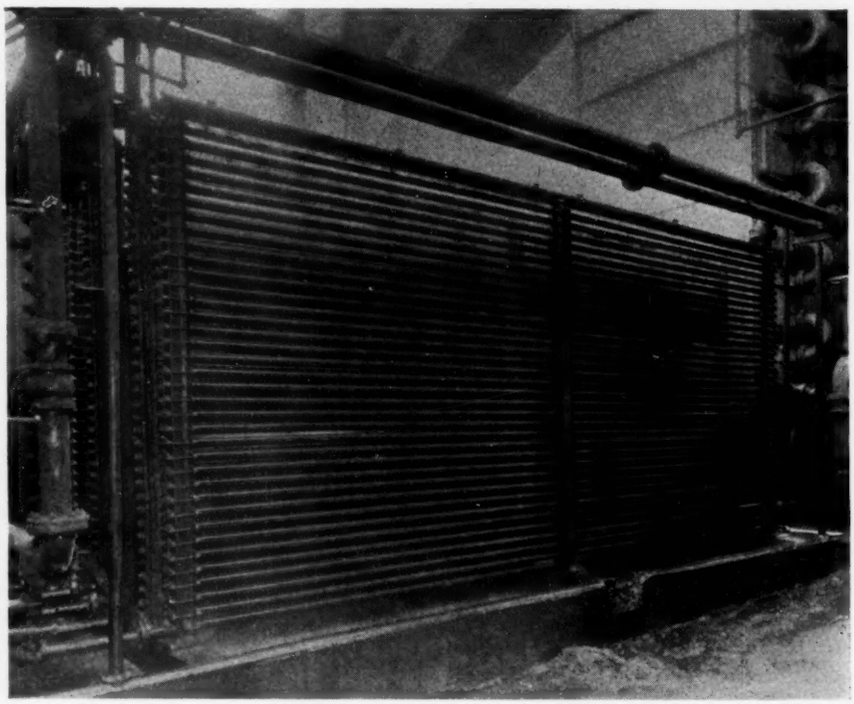
Dairy Industry

Right at the moment the most potentially useful application of welded glass piping is in the dairy industry where standard equipment now is made of tinned copper or stainless alloys with quickly demountable joint construction to facilitate dismantling and reassembly. The sanitary codes of most states require complete dismantling and thorough cleansing and sterilization of the component parts of milk handling equipment after each "run". This is, of course, costly in labor-time. Recent experimental work has shown that jointless, welded glass pipe-lines can be cleansed thoroughly without dismantling and that bacteria count can be closely controlled. Ultimately, this should mean a substantial reduction in cleaning costs which represent a sizable fraction of the overall costs of operating a dairy. At the ends of the pipe line where connections are made to coolers, filters, tanks, valves, etc., it will be possible to quickly sterilize the piping with small portable devices to kill all bacteria.

Pending further field testing of welded glass piping in the dairy field, and approval of its use by state sanitarians, it will be possible to use standard "Pyrex" Tubing in place of metal piping. Means have been developed for securely connecting such glass tubing to standard sanitary metal fittings such as elbows, tees, valves, etc., which will probably be made available in limited quantity. This glass-metal combination will be easily demountable and readily cleaned. And by using simple, portable equipment, the tubing can be cut accurately to the desired length, then fused and annealed in the field, so that ordinary dairy workmen can make initial installations and quick repairs using standard glass tubing from local stocks. The joint construction not only withstands dairy-service pressures, but is also more flexible than the all-metal joint and, therefore, stands up well against vibration.

Centrifugal Pumps

Supplementing glass piping is a new line of glass centrifugal pumps. Since introduction of the first model about three years ago, hundreds of them have been placed in operation in some of the toughest pumping services in the chemical industry and have come through with flying colors. Although the pumps are well armored and protected by metal, they are so designed that the liquids come in contact with no metal at all. Their volutes, headplates, and impellers are all of glass, and these parts, incidentally, are finished precisely to dimensional tolerances as close as those of high grade metal pumps. A unique stuffing box arrangement employs a rotary ring-seal, the rotating member of which is made from 96 per cent silica glass, whose thermal shock resistance is so great that the pump may be allowed to run dry without fear of breakage from the frictional heat thus generated in the stuffing box, and the resultant thermal shock when cold liquid again enters the pump. The "glass smoothness" of the ring's operating-face enhances over-all pump-efficiency by reducing friction drag; and chemical stability assures long life and trouble-free operation in corrosive service which quickly destroys the highest grade metal shafts and stuffing box assemblies. The pump impeller is an outstanding illustration of the manner in which glass and metal can be joined together to provide a strong assembly having the advantages of both and the weaknesses of neither; this is accomplished by molding the glass impeller disc with an integral, hollow stub shaft having longitudinal splines and radial grooves. A metal plug having corresponding splines and grooves is dropped in and locked permanently in place



Cascade cooler with 2″ glass tubes, 20 feet long. (Corning Glass Photo)

mechanically with a low-melting metal alloy. Since the impeller is statically and dynamically balanced, there is little vibration in the pump.

Fish Net Floats

An astonishing quantity of floats are required by the fishing industry for proper control of nets. Aluminum, steel and glass have been largely used for this purpose, but now the first two materials are difficultly procurable and the supply of cheap glass floats from Europe, Japan and Russia is no longer available. Mechanized methods for producing our total requirements from glass at low cost are under development.

Precision Bore Ware

The art of forming glass on a mandrel to extremely precise shape and size is no longer new, but great strides are being made in further utilizing the uniquely useful combination of qualities afforded by glass by this means; great accuracy, coupled with transparency and requisite mechanical strength thus forms the basis for design of new instruments for visual indication of flow of liquids or gases under pressure, also for construction of precisely-formed mechanical parts. Rotameters, of the type now widely used in the chemical industry, are an example, but some of the newer, interesting applications in warplanes cannot be mentioned here.

Lighting

The recent development of fluorescent-tube lighting is opportune from a number of viewpoints; not only does it give the same illumination with a saving of 55 per cent in electrical power, but the improved quality of the light lessens the fatigue of workers and improves their efficiency and productiveness now when these are so urgently needed. Furthermore, the tubes last two and one-half to three times as long as incandescent lights. Formerly, it was necessary to use lead-glass for the tubes, but other suitable glass-compositions have been developed, free from lead. In fluorescent light fixtures, end caps and reflectors are replacing metals.

Commercial and residential lighting fixtures such as bases and columns for table and floor lamps are in production and it is expected that accessories such as outlet plates, socket shells, socket covers and silvered reflectors for indirect lighting will shortly be available in quantity, all of which replace metals, mostly copper and brass.

Not to be forgotten as a conserver of metals is the all-glass sealed-beam headlight for automobiles just coming into widescale use and which has not only eliminated the necessity for a plated brass reflector shell but improved road illumination markedly as well.

Housewares

In this war more than ony other, safeguarding of the home front is of paramount importance; and in the face of curtailed supply of metal ware for cooking and food preparation, past and current developments in glass stand in good stead. Even in those instances where small amounts of metal and plastic accessories have been used with glassware, successful efforts are being made to displace them; handles, covers, percolator baskets and percolator pumps are now supplied from glass instead of stainless steel or aluminum or plastics. And for coffee makers of the double-bowl vacuum-type, ground joint construction has been developed to eliminate the need for rubber bushings.

MISCELLANEOUS

There follows a listing of some of the more interesting new developments in glass application, some of which are still under development or have not yet attained large-scale commercial production:

Thermo-Couple Protector Tubes

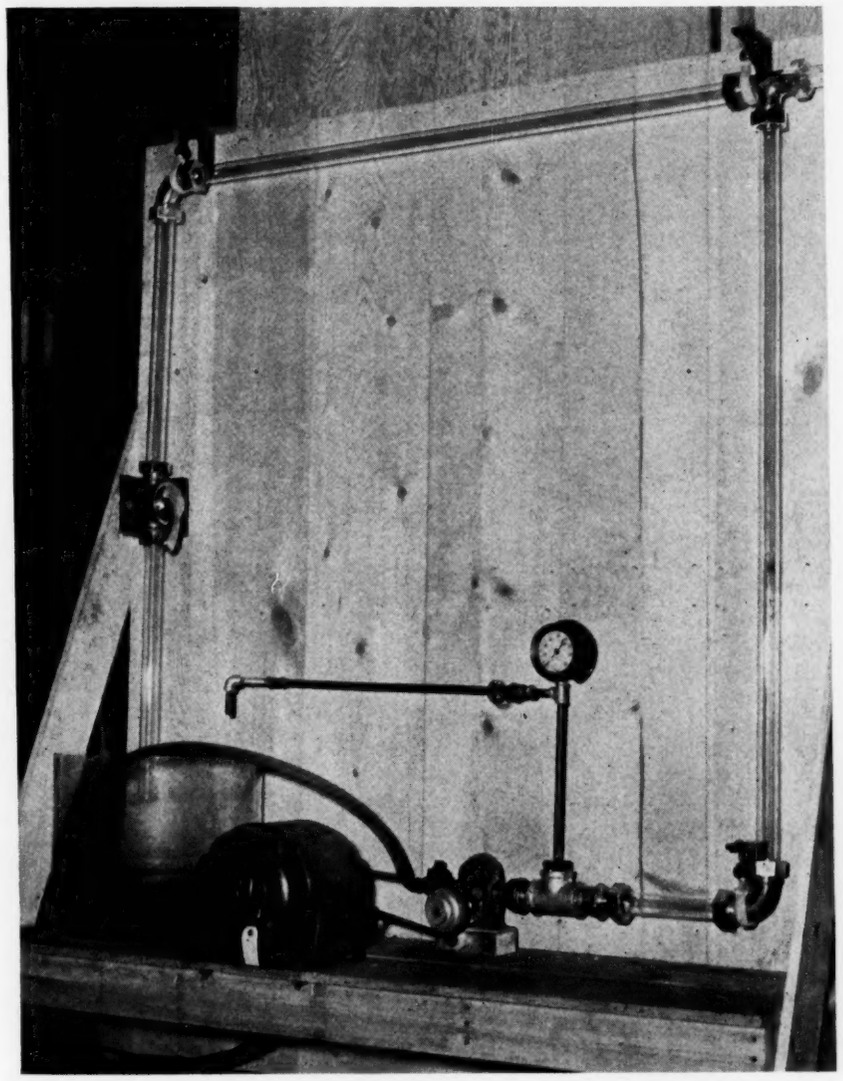
Tubes of 96 per cent silica glass are being used to shield sensitive thermo-couples against corrosive furnace atmospheres at temperatures up to 1000° C., displacing special alloys formerly used.

Sole Plates for Electric Irons

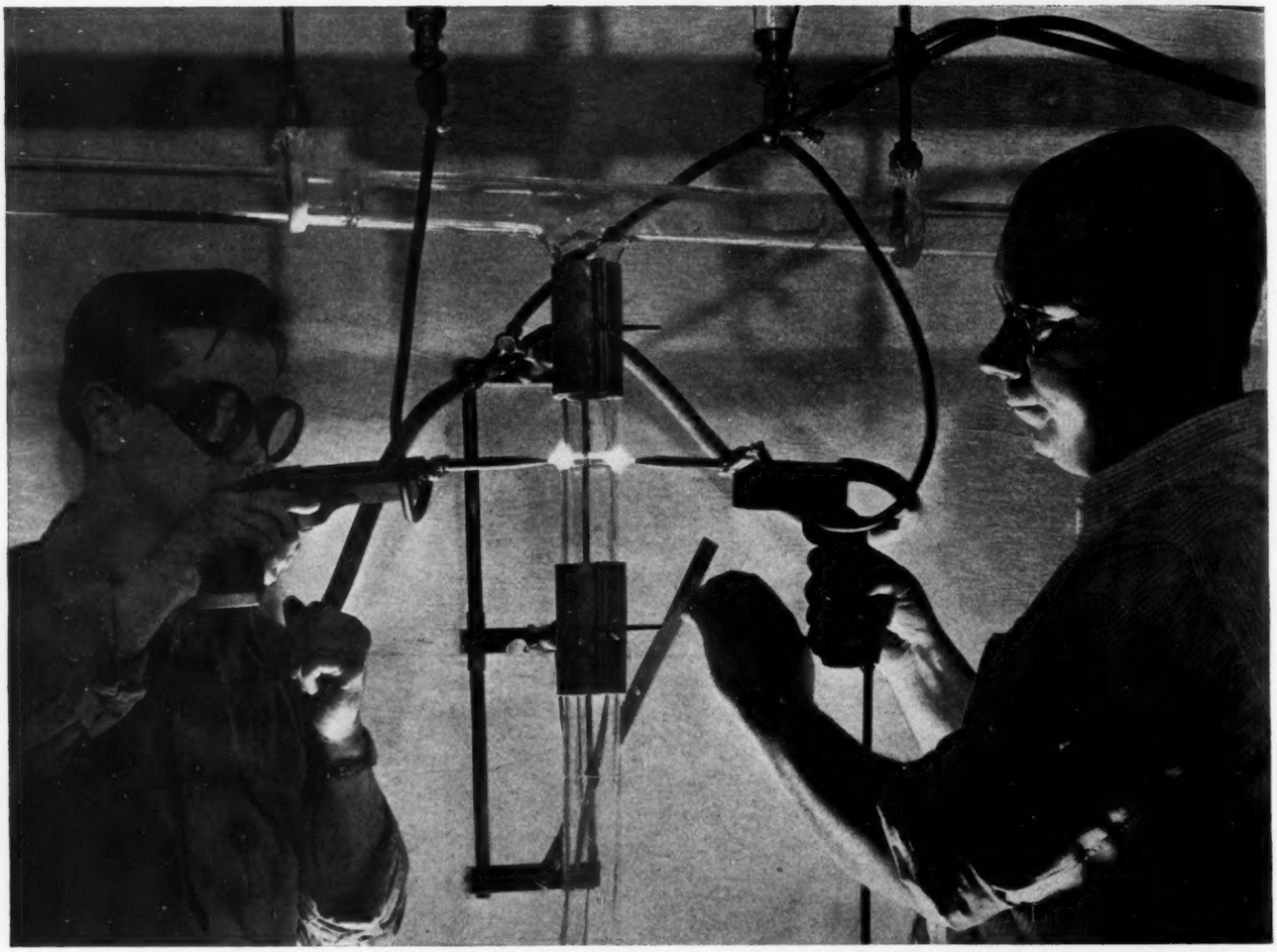
Clear 96 per cent silica, because of its heat resistance and transparency to infrared radiation, has demonstrated unique characteristics as a sole plate for electric irons.

Powdered Glass-Powdered Metal Mixtures

Preliminary experimental work with sintered mixtures of glass and metal



New type glass piping which can be cut to length on the job and firmly connected to standard sanitary metal fittings. (Corning Glass Photograph)



Electrically welding glass piping in-place using standard glass piping, tees and elbows. Pin-point oxy-hydrogen flames act as flexible conductors for the high-frequency welding current. (Corning Glass Photo) ***See photo page 38.***

powders gives promise of developing useful new materials of construction, some of which would relieve metal shortage.

Glass Eyes

Cessation of imports from Europe have necessitated development of the special glass compositions required for glass eyes and these are now available.

Highway Reflectors

Roadside reflector discs mounted at 35 yard intervals to clearly outline the highway are proving to be real aids to night driving, particularly over winding roads in fog, rain or snow, and may be increasingly useful in black-outs or dim-outs.

In another highway application, minute glass spheres, approximately one hundredth inch diameter, are dusted on the newly painted center-stripe to improve night-visibility by increasing the backward reflection of auto lights.

Floats

Specially designed "Pyrex" floats have been adopted to replace the metal ones formerly used in humidifying systems in domestic warm-air heating systems. For this purpose, glass has proved to be more durable than copper because of the corrosive nature of the saturated salt solution quickly formed in the water pan at high temperatures. Glass floats for toilet flush tanks are also being used to replace copper.

Plumbing

In toilet flush tanks, the over-flow pipe and water inlet pipe can be made of glass tubes having a metalized band on one end to permit soldering directly into recesses in corresponding cast fittings.

Potentially, the most useful present application of glass in plumbing is replacement of copper tubing and wrought iron piping, the sizes of which are mostly 1" diameter or less. Glass is adequately strong for the pressures involved and can easily withstand the thermal shocks of hot water service. Furthermore, its resistance to scaling would be an advantage, but it must be confessed that a really satisfactory, simple joint construction for plain end tubing has not yet been developed, although work in this direction is still continuing.

Snap and Plug Gauges

For material from which to make precision gauges of the snap and plug type, boro-silicate glasses offer a number of advantages, among which are hardness and abrasion resistance; also, their low thermal-expansion and low thermal conductivity minimize dimensional changes resulting from temperature changes imparted by handling or other means. It is reported that such glasses are used for this purpose in England to replace metal; American and Canadian gauge makers are following suit.

Glass Rollers

In the textile industry, advantage is being taken of the hardness and abrasion resistance of boro-silicate and 96 per cent silica glass. Thread-guides, rollers, bars or assorted shapes and sizes, are finding increasingly useful applications in this industry.

Mechanical rolls, securely bonded to accessory metal fittings, complete with ball-bearings, and having precision-finished faces, have been supplied for certain purposes where accuracy and smoothness of glass surfaces are im-

portant considerations, coupled with resistance to abrasion and corrosion.

Rollers of glass, large and small, replace metals in steel-pickling tanks where they are exposed to sulfuric acid, and in numerous other services such as the conveying and guiding of delicate organic films through chemical treating baths without scratching them.

"Foamglas"

The shortage of cork for low temperature insulation and the shortage of magnesia, asbestos and other materials for higher temperatures will shortly be at least partially alleviated by foamed or cellulated glass. This new product called "Foamglas" by its makers, the Pittsburgh-Corning Corporation, will be available in standard blocks and special shapes having a density of only 10 to 11 lbs. per cu. ft. and a thermal conductivity of .45 B.T.U./hr/sq. ft./°F./inch at 70° F. which compares very favorably with cork under actual service conditions. Since the low density is attained by incorporation of small totally enclosed gas bubbles, the material has no interconnecting pores or channels and cannot become soggy or lose efficiency upon exposure to water or dampness incident to refrigeration or other wet service conditions. Its upper temperature limit of 1000° F. permits a broad range of industrial applications. But of equal interest is its relatively great mechanical strength compared with most insulating material. It has a tensile strength of approximately 100 p.s.i. and crushing strength of 150 p.s.i., thus providing substantial load-carrying capacity. Also, it can be walked upon without serious damage. Aside from insulation, there are other potential applications of particular interest now. These are: Floats and life-boats, life rafts and life preservers, fishing corks and pontoon bridge floats. When "Foamglas" becomes commercially available in the near future, the Armstrong Cork Company will collaborate with Pittsburgh-Corning in marketing it in the cold storage field.

Glass Battery Jars

For many years, "Pyrex" battery jars have been used for stationary work such as telephone substations and railroad signal service. Automobile-batteries have not until recently been made from glass in this country, largely because of difficulty in molding the partitions between cells. This difficulty has now been solved by further development of the technique employed in manufacture of glass building blocks. It will be possible thereby to replace the rubber and asphaltic compositions now in general use.

Fiber Glass

Developments in fibrous glass have been well publicized and need no detailed recounting here, but it is worthy of note that Fiberglas has made possible substantial reduction in size and weight and quantity of materials needed in electric motors and other electrical equipment. Special glass textiles are being used in important military equipment; and special insulating materials permit savings in weight, space and construction time in the building of our warships and tankers, cargo vessels and airplane factories. Were it not for the availability of "Fiberglas", there would have been by now a critical shortage of asbestos for military and industrial purposes.

Jewel Bearings

Among the unseen but vital innards of ammeters, voltmeters and other sensitive electrical instruments are the pivot bearings. Since the steel pivot often has a radius of only .001 inch, relatively light loading results in enormous pressures on the jewel. Stresses of hundreds of tons per square inch are not unusual. To withstand such stresses without crushing or wearing too rapidly, it has heretofore been considered necessary to use sapphire jewels, but these are no longer available in the required quantity. Fortunately, glass compositions have been developed having the necessary resistance to impact, abrasion and crushing, and instrument bearings are being produced commercially to fill this urgent need.

Spray Nozzles

In the chemical industry, particularly, spray nozzles made entirely of glass or having glass parts are replacing metals.

Glass Springs

To the general public it is astonishing that a material as stiff as glass can be used as a spring. Actually, glass has a number of properties, which commend it highly for certain types of spring construction; it is more truly elastic than steel and retains its elasticity over a broad temperature range; it is immune to acid-attack; but third, and most remarkable of all, is its apparent immunity to fatigue. A glass spring such as this was designed to develop a force of 1 lb. when deflected 3/32" and was intended for use in a sulfuric acid mist; after 8,000,000 deflection cycles under full load, there was no evidence of failure. Glass is, of course, not as strong as spring metals even when "tempered", but when so-treated it can safely be used at fiber stresses of 2,000 pounds per square inch or more. For lightly-loaded springs this is ample.

Electrical Parts

Conventional electrical insulators made of glass in numerous sizes and types have been widely used for many years; it has now become possible to utilize glass even more extensively because of recent developments and improvements in fabrication methods which permit it to be formed into intricate shapes having accurate threads, holes and other design details previously impossible to produce economically. Also the new methods permit incorporation of a rather broad range of predetermined electrical characteristics in specially designed insulator parts. "Loss factor", for instance, which is a particularly important characteristic in design of ultra high frequency radio equipment can be held to very low figures while still retaining other desirable electrical characteristics.

The indifference of low-expansion glass to wide thermal changes, coupled with low expansion coefficient and dimensional stability, make it particularly useful for coil forms which must be exposed to atmospheric temperatures of -50° F. to 160° F. Other applications are as end plates for coil forms, mounting blocks, co-axial line spacers, etc.

Conclusion

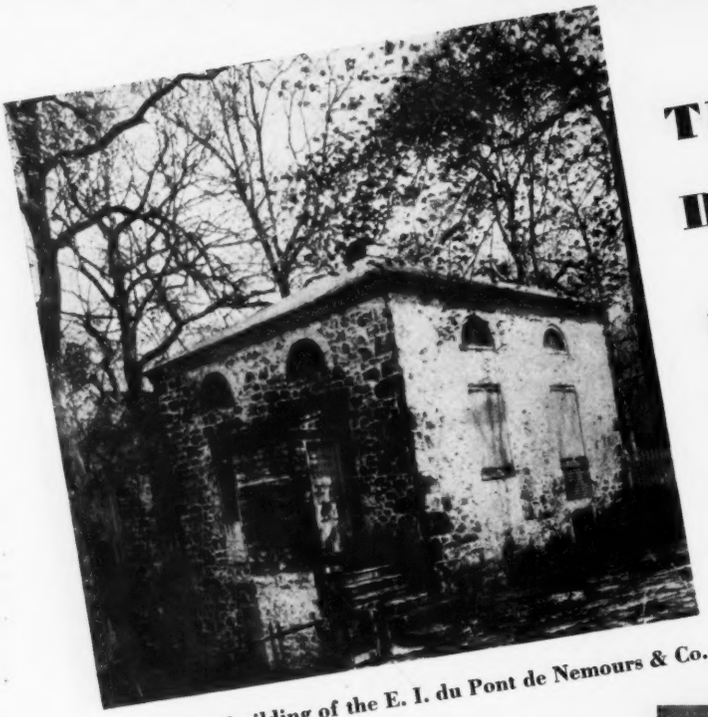
Some of the developments and applications of glass in connection with the war effort cannot be detailed here. Among these are uses in ammunition and ordnance, also new optical glasses and methods of producing them.

From this brief review, it is clear that glass is playing a vital role during these critical days even though some of the applications referred to are of the "substitute" variety and are, therefore, of temporary interest only. But it is also clear that the ever-expanding knowledge of its properties and uses discloses it as an astonishingly versatile material which is destined to play an increasingly important part in rebuilding and enhancing our standard of living during the reconstruction period after the war ends.

FOOTNOTES

(1) U.S. Pat. #1,304,623 Eugene C. Sullivan, Wm. C. Taylor.

(2) U.S. Pat. #2,221,709 H. P. Hood, Martin E. Nordberg.



First office building of the E. I. du Pont de Nemours & Co.

THE DU PONT COMPANY

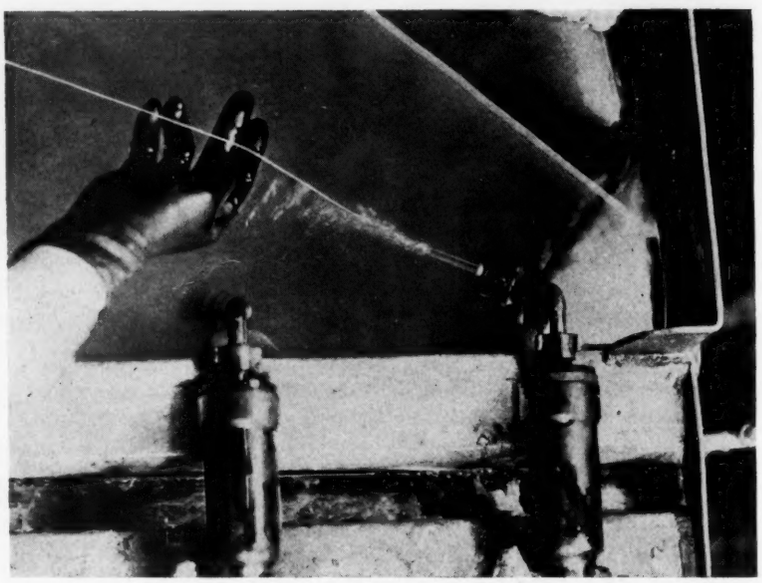
What it is --- What it was

By William S. Dutton

Du Pont, creator of "better things for better living," cannot be described by any term signifying a single activity. It is an "industry's industry" serving all basic ones as well as the nation itself. This is the story of that unparalleled service maintained for 140 years.

FIFTY years ago, our grandfathers knew E. I. du Pont de Nemours and Company as the world's largest manufacturer of explosives for industrial use—and it still is. In 1914-18, those of us who are now past 40 knew Du Pont as the foremost producer of military explosives—and it was and is. Then, as now, munitions were desperately needed. But to describe the Du Pont Company of today as an explosives manufacturer, or munitions manufacturer, or by any term implying a single dominant interest, is like saying that Marshall Field of Chicago is a furniture store or that Liggett's deals only in drugs.

From the close of the First World War until September, 1939, military explosives constituted less than two per cent of the Du Pont business. Moreover, up to that time, less than fourteen years of the company's operations had



Liquid viscose transformed in a chemical bath into cellulose filaments to make rayon thread at Du Pont's Virginia plant. (Note spinneret.)

Alkali cellulose has been formed into xanthate through chemical reactions in this baratte. (This is part of the process of rayon making.)

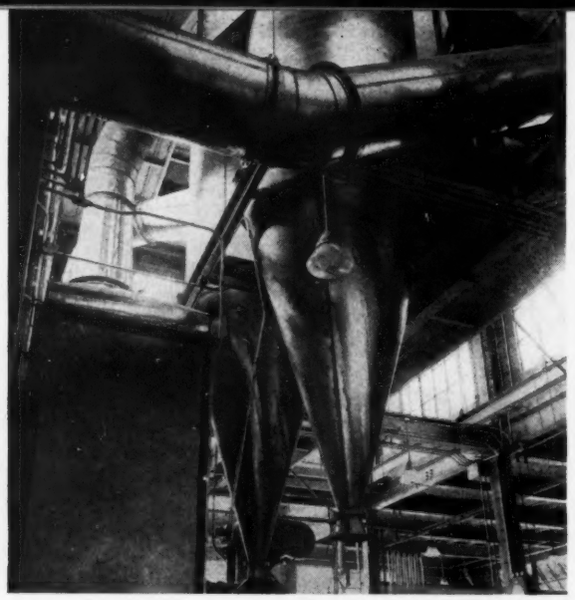
Colorist making dyeings in standardization room, Dyestuffs Division. Here a yellow dye is being applied to a cotton skein and results are checked to see if it conforms to requirements. This operation is repeated incessantly.

been devoted to war activities in each instance precipitated by national emergencies.

The very fact that the United States now finds it urgently necessary to build huge plants for the production of war explosives, ammunition and arms of all kinds, to which Du Pont again is giving great effort—is in itself striking evidence of the very minor part played by munitions in times of peace. Wars make the headlines of history that stick in men's memories, but industries and nations are built to permanence by the orderly, less spectacular work in peacetime. So it has been with Du Pont over 140 years, an anniversary that the company is marking in this year of 1942.

Nylon processing. Molten polymer, extruded on this casting wheel, is sprayed with water and solidifies it to strip resembling ivory.

E. I. du Pont de Nemours



These "cyclones" are used to recover powdered vinyl acetal resin from drying air in resin-making process.

Timely treatment with chemicals to check spread of fungus diseases and insect pests which cause inestimable damage.

Select almost any object in the room where you sit and you probably will find that Du Pont contributed to its manufacture. Evaluate those contributions and you will learn they include inventions and discoveries outstanding in industrial science. Cellophane, the "Duco" lacquers, nylon, neoprene—each of these, unknown a generation ago, stands today as an example of Du Pont initiative and venture. In the same breath you can mention rayon, dyes, plastics, perfumes, paints, fertilizers, plating materials, heavy chemicals and literally hundreds of other products.

From the blackest of black sands, Du Pont factories produce the whitest of white finishes. They transform the fuzz of the cotton seed into cords for the toughest of truck tires, or into yarns for the finest of fabrics. From wood and coal they make materials that simulate the clarity of crystal, the opacity of ivory, the depth of turquoise, and the beauty of lapis lazuli. The hues of the rainbow and the delicate fragrances of flowers are derived from black messy coal tar. The gossamery filaments of nylon are spun from coal, water and air, not only to replace but to excel silk.

It is the normal function of Du Pont laboratories to create new things and improve old ones, to reduce the costs of goods and services, and to create new wealth in its most tangible form—that is, things that can be put to everyday use—and in so doing to make smokestacks sprout in corn and hay fields. Fortunately, the company has been blessed with vision from the outset, when this nation too was young.

At the turn of the Nineteenth Century, Europe was undergoing a series of crises similar to those of the present. Out of the French Revolution had risen Napoleon to become dictator of France and later conqueror of most of Europe. England was fighting for its life. Our young, weak nation was trying desperately to keep Europe's war from spreading to America.

Among other things, America badly needed gunpowder. The only good powder was imported. It was high in price, but almost as important as clothing or food at that stage of the nation's life.

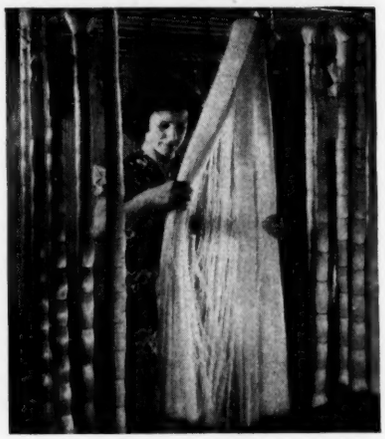
It was needed on the frontier. It was required for food and clothing. It was in growing demand for clearing land, mining, and engineering.

Among the refugees then in the United States was a young Frenchman, Eleuthère Irénée du Pont de Nemours. He had been trained in powder-making by the great chemist, Lavoisier, as the first step in what was to be his general chemical education. Lavoisier had been beheaded and Du Pont's father imprisoned.

Du Pont was thirty years old. He had a wife and three children to support. He was without capital, but he did have friends. One of them was Thomas Jefferson. He encouraged Du Pont to raise funds and erect a powder mill on Brandywine Creek, near Wilmington, Delaware. Thus, the Du Pont business was founded, in 1802.

There were difficulties from the outset. Only a part of the capital promised Du Pont was ever paid in. Two years passed before any powder was ready for sale, and then customers insisted on long credit, which necessitated constant borrowing from banks. Explosions destroyed part of the mills. Du Pont's partner deserted. However, when the war of 1812 threatened the nation, Du Pont gunpowder was ready to defend it.

Emergency orders for 50,000 pounds, then 200,000 pounds, then 500,000 pounds were placed with the Du Pont mills, They had to be urgently expanded. Already in debt, the company had to borrow heavily to get the needed funds. The government was in no condition to advance them. But ultimately came victory and a satisfactory



Inspecting hank of finished nylon ready for brush bristle use.

Reaction kettles used in one step in vinyl acetal resin manufacture.

peace. The Du Pont books showed $125,000 tied up in raw materials and finished powder, debts in excess of $100,000, and about $10,000 in bank.

E. I. du Pont felt the nation had profited from the war, though his company had not. He wrote ".... Should its final result produce no other good but to secure the establishment of home manufacturers, so that we could manufacture our own produce for our own use, it would repay the nation ten-fold for every expense or loss...." And he added "Manufacturing is a true creation of wealth. It is taking cotton which costs 20 cents per pound and making it *worth* several dollars. It is taking wool at $1 and selling it again at $6 or $7 when it has received its metamorphose from our industry. Let us reap then the full advantage that this war may produce. Let us secure forever the establishment of American manufacture..."

Thus, over a century ago, was enunciated the doctrine that the United States should make itself economically as well as politically independent. It is still the doctrine of this company.

For thirty-two years, until his death, E. I. du Pont worked to place a firm and lasting foundation under the American explosives industry. In accomplishing this end, he performed a notable feat. Up to his time, no American powder mill had been able long to survive the hazards of the business and foreign competition. Du Pont's mills alone survived.

This was the year 1834. The term workmen's compensation was yet to be coined, the labor movement yet to be born. But Du Pont made it his rule that if a workman was accidentally injured in the Du Pont service, the company would assume the obligation for his adequate care; that in the event of accidental death, the workman's dependents would receive care. He asked no man to take risks he would not take himself, but by every means at his command he sought to eliminate risks. When, today, we talk about safety in the Du Pont Company, it is no new subject. It is as old as the company itself.

It is easy to forget that every "big business" was once a "little business", and that work, sacrifice and worry went into its building. Those early Du Ponts escaped none of these. They lived within sight of the mills. The firm's headquarters, a small stone structure, was only thirty paces from the senior partner's home. As the years passed, a hole was worn through the bare plank flooring under his desk where his feet were accustomed to rest while he worked.

Smudges from the powder dust covered the walls of the firm's conference room. The conferences often looked like meetings of coal miners, because for years the senior partner was the only male Du Pont holding a white-collar job.

All savings were reinvested in the business. They furnished the new capital for expansion, and constituted the proverbial umbrella for rainy days.

The manufacturing part of the business was wholly in the hands of those whose name it bore, and from father to son and to grandson they were willing to make every personal sacrifice that it might succeed. At least two Du Ponts gave their lives to the business, being killed in accidental explosions.

The first fundamental change in the character of the explosives industry was made, in 1857, by Lammot du Pont, father of the three brothers, Pierre S., Irénée and Lammot du Pont, who have been most prominently identified with the company's management in recent years. Until this change, black powder was the only explosive in general use. Various granulations were made for firearms; others were employed in industrial and agricultural blasting. But all were compounded of the same three raw materials—saltpeter, sulfur and charcoal. The saltpeter came from India.

By every means in their power the Du Ponts opposed the Civil War. They believed, with Henry Clay, that the issues could be settled by compromise. In 1860, when the election either of Lincoln or Breckenridge meant almost certain conflict, they vigorously supported John Bell, the Constitutional Union candidate, who in a similar campaign today would be called a pacifist. However, they were among the first to pledge their loyalty to Abraham Lincoln when war came.

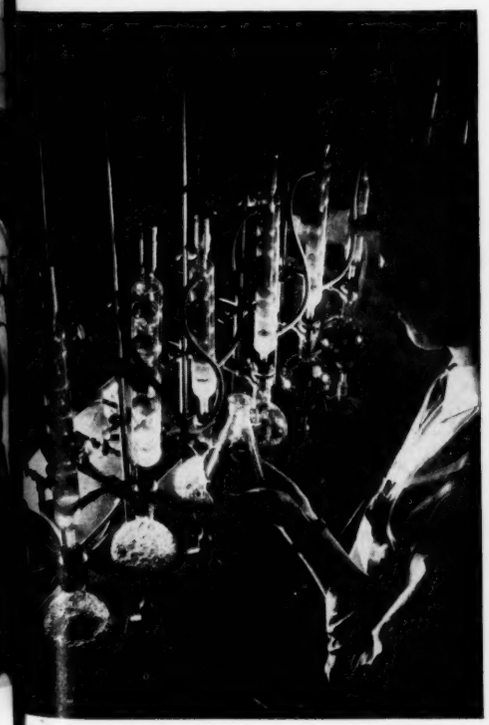
The Du Pont powder mills were not only the largest in the country, but Lammot du Pont was the country's foremost authority on explosives chemistry.

Working with Captain Thomas J. Rodman and Union Army experts, Lammot du Pont concentrated on this work. He designed machinery for producing new powder granulations for big guns. For the first time, use of large-caliber rifled cannon became practicable.

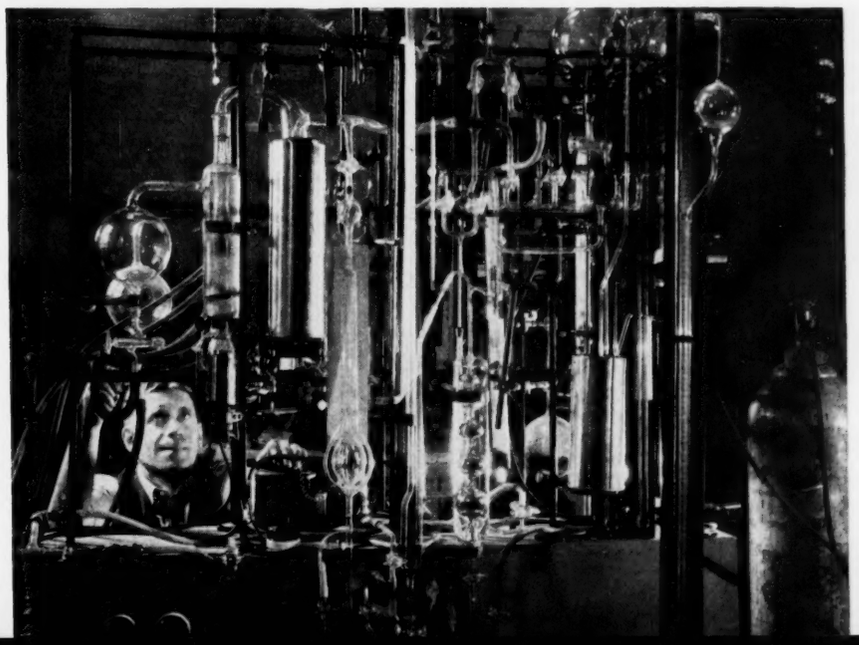
The war had progressed only a year when exhaustion of the North's supply of India saltpeter became critical. Acting under secret orders, Lammot du Pont went to England and by a bold move bought all the saltpeter England had available. Later, technical skill utilized a process called "double decomposition", outlined by E. I. du Pont as early as 1831, and converted South American sodium nitrate into potassium nitrate suitable for gunpowder. Dependence on India for nitrate ceased.

In other ways, the Du Pont Company

Reflux units used in ascertaining resistance of brown dye to some metals.



High-vacuum apparatus in chemical department for measuring surface area of fine powders such as pigments. Process involves measuring gas adsorption.



helped establish a new science in powder manufacture. One notable accomplishment was maintaining prices at practically peace-time levels despite rising costs in every field. By May, 1864, saltpeter had advanced 135 per cent in three years, sulfur 80 per cent, charcoal 50 per cent, Du Pont wages 75 per cent. However, that year Du Pont powder sold for 33½ cents a pound, or only 8½ cents higher than the price of first-grade gunpowder in 1800.

At the front, Henry A. du Pont won a colonelcy and the Congressional Medal of Honor. Samuel Francis du Pont became a Rear Admiral of the fleet and President of the Naval Strategy Board. Du Pont Circle in Washington, D. C. is named in his honor.

It is estimated that the company furnished about 4,000,000 pounds of gunpowder to the Union forces during the war. No other manufacturer produced anything like that amount.

No previous war had consumed gunpowder on such a tremendous scale—tremendous, as viewed in 1865. We would dispense with adjectives today.

Only two of the several smokeless powder plants now being built by Du Pont for the government will, upon completion, be able to produce more than double that amount of gunpowder in a week!

Excepting the Spanish-American War, almost a half century of peace followed Appomattox. The period witnessed industrial changes vaster than the world had experienced throughout its history. The House of Du Pont was overhauled from cellar to attic.

This overhauling, oddly enough, began in a Swiss kitchen and traveled over two continents before it finally moved in the Du Pont door. In 1845, a Swiss chemistry professor, Christian Frederick Schoenbein, brewed an unsavory mess on the kitchen stove, in the absence of his good frau. His pot contained sulfuric and nitric acids.

Suddenly, it boiled over. The acids spilled over the kitchen floor. Horrified at the thought of his wife's return, the professor grabbed the nearest cloth, a cotton apron, took a pail of water and mopped up the evidence of his carelessness. He placed the apron by the fire to dry. In a few moments there was a "pouf"—and the apron vanished. Neither smoke nor odor was left behind. The professor had made an epochal discovery. He had nitrated cotton!

That same year in Turin, Italy, another chemistry professor, Ascanio Sobrero, nitrated glycerin. These two inventions, nitrocotton and nitroglycerin, were destined to remake the face of the earth once men had learned to handle them.

Suppose we consider Sobrero's invention first. So highly explosive was nitroglycerin, and so little understood was its use, that it was virtually a scientific outlaw for twenty years. Death and destruction followed whenever men attempted to make or ship it. Yet the fact developed that this new high explosive, with all its faults, would do almost five times the work of black blasting powder—and do it better. Properly controlled, it promised to become a builder mightier than any the world had known.

For more than 60 years Du Pont has been one of the largest producers of dynamite. Here, dynamite is shown blasting a new channel for a river stream.

Such a builder was needed, especially in America. The country was being knit together by new railways and highways. Industry was demanding ever-greater quantities of iron, coal and other metals. Black powder was much too puny a blaster to remove the billions of tons of rock and earth incidental to accomplishing these tasks.

Out of the work of Alfred Nobel, in 1866, came dynamite, the first "safe" high explosive for industry—safe, that is, when treated with respect. Soon builders were calling dynamite one of the great boons to man's progress. It was to do for mining and construction what steam-power was already doing for transportation and manufacturing. It was to make possible the Machine Age.

Schoenbein's invention was equally remarkable. Like nitroglycerin, nitrocotton is highly explosive; this property led Schoenbein to call it guncotton. In giving it that name, he actually did himself an injustice. What he had discovered was not, in fact, just a new explosive but a new material—cellulose nitrate—capable of being expanded into a whole family of other new and yet undreamed materials.

First, a Boston medical student, Maynard, put cellulose nitrate into a solution of ether and alcohol, two chemicals found in every medical laboratory, and got—Collodion. Painted over a skin wound, it dried quickly into a smooth, tough protective coating. Army surgeons employed it for this purpose in the Civil War. Soon its use was world wide.

Parkes, an English experimenter, varied the nitrating formula by using smaller quantities of acids, added camphor, and succeeded in forming another new substance he molded into a solid. An American printer of inventive mind, Hyatt, taking his clue from the work of Parkes, improved on it by using heat and pressure in his mold. From it came "Celluloid", the first practical pyroxylin plastic.

The highly dangerous explosive discovered by Schoenbein was now tamed to a point where babies' rattles could be made from it. Shiny white "Celluloid" collars set a new style in male neckwear. Gradually, the uses of pyroxylin plastics were extended to embrace combs, hair ornaments, buttons, umbrella handles, and scores of things formerly made of bone, horn, tortoise shell and ivory.

Next, about 1884, the French chemist, Hilaire de Chardonnet, built a machine

that was inspired by his observation of the silkworm. The heart of the machine was a little cup perforated with tiny holes, called a spinneret. De Chardonnet forced a solution of cellulose nitrate through those holes and watched the fine streams of liquid solidify in the air into the first filaments of what he christened "Chardonnet silk", the forerunner of rayon. It launched an industry that presently was to change the wardrobe of the world.

Smokeless Powder

By this time, four decades had passed since Schoenbein's original discovery but guncotton was still not usable in guns. Then, in 1886, a Frenchman, Vieille, developed a gunpowder of cellulose nitrate base that burned rapidly rather than exploded. His invention, smokeless powder, constituted the first fundamental change in gunpowder made since its discovery. It was to revolutionize warfare.

Of course, the Du Pont Company, then exclusively a maker of explosives, was interested both in Nobel's dynamite and Vieille's smokeless powder. Du Pont chemists began their own experiments with cellulose nitrate. Collodion and pyroxylin, as well as all the chemicals entering their manufacture, became established Du Pont raw materials.

Soon, too, those other things began to take outline. Pyroxylin was adapted for use as a lacquer finish for brass and metal hardware that was highly polished. In another form it became the outer coating in manufacturing "artificial leather", or in today's term "Fabrikoid" pyroxylin-coated fabric.

Then, quite appropriately, a Swiss living in France, Jacques Brandenberger, stepped to the front in this international parade of invention that was making cellulose a raw material that was going to rank with iron and steel in usefulness. Borrowing clues he found in the development of viscose rayon, he created cellophane.

Against this background, one needs to exercise little imagination to grasp why Du Pont, exclusively a maker of black powder for almost seventy years, was to become also the world's largest producer of dynamite, and still later a great diversified chemical company. Dynamite was one of the first tasks undertaken by Lammot du Pont following Appomattox. Near Gibbstown, N. J., he founded what was to become the world's largest dynamite plant, known in the company as Repauno. He was killed at this plant, while introducing an important improvement in dynamite's manufacture. The perfection of a Du Pont smokeless powder was one of the first tasks undertaken by Lammot's eldest son, Pierre S. du Pont, when he joined the company in 1890. Becoming interested in smokeless powder, the company necessarily became interested in cellulose, out from which ran many chemical trails already blazed but as yet only lightly traveled.

The year of 1902 marked the end of the first century of business. The start into the new century was made, approximately, with new and younger hands at the company's helm. Three cousins—Coleman du Pont, Alfred I. du Pont, and Pierre S. du Pont—purchased the business from their elders, borrowing the funds to do so. They reorganized as a corporation, brought new blood into the management—young men who were in no way connected with the Du Pont family—and the future was plotted along broader lines.

The initial departure from explosives was made in 1904 when the company began producing cellulose lacquers for hardware. It was the brass bed era and these clear, water-like lacquers were the first line of defense against brass tarnish. Six years later, cellulose-coated fabrics, then known as "artificial leather", were added to the growing Du Pont product list. Cellulose plastics joined the new product group in 1915, rubber-coated textiles in 1916.

Holdings Divided

An event of 1913 directed attention even more earnestly beyond explosives. A United States court decided that Du Pont's holdings in the explosives industry were too large and ordered them divided among three companies—the Hercules Powder Company, the Atlas Powder Company, and the Du Pont Company. Upon the government's own petition, the smokeless powder business was left intact with the Du Pont Company "in the public interest". The order, nonetheless, was a check upon expansion in the explosives field.

The World War proved a gigantic diversion from this progress toward diversification. Smokeless powder was needed urgently in unheard of quantities, which the Allies could only partially furnish. Without American help, their defeat threatened. This nation, as now, became the great supply source of the Allied armies and navies. In four years, Du Pont factories, hurriedly erected for that emergency, shipped abroad or supplied the American forces at home with one and a half billion pounds of explosives. The total included forty per cent of the smokeless powder fired by Allied guns.

As was the case in the Civil War, the story of Du Pont prices for World War powder is unique. Despite sharply rising costs, the original price of $1 per pound, which included cost of building temporary war plants, was down to 55 cents per pound by September, 1916. That was practically the price of powder in 1913. With America's entry into the war, the United States and its Allies alike paid from six to twenty per cent less for Du Pont powder than the price set by Congress as fair in 1913.

Reduction Voluntary

These reductions were made voluntarily by the company. More than one-half of the output of powder for all governments in 1914-18 was sold at 1913 prices or below, notwithstanding inclusion of huge plant construction costs in the early quotations. Meanwhile, prices of wheat, flour, cotton, textiles, steel and other commodities doubled and trebled.

In 1917 the company entered the dyestuffs business, largely as a consequence of the emergency. The United States imported 90 per cent of its dyes and other organic chemicals in 1913. Shutting off of this supply by the war seriously jeopardized such large American industries as textiles, leather tanning, paper and ink. Hospitals were short of medicines. Some chemicals from which are derived dyes are essential in making high explosives such as T.N.T., and also smokeless powder.

More than $40,000,000 were invested by the Du Pont company in the dyestuffs business over a period of 18 years before the accumulated losses were written off the books and the first dollar of profit was entered. However, in the present emergency, America has an independent organic chemicals industry, supplying the great bulk of America's need and having an exportable surplus.

The importance of nitrates in war is almost equaled by their value in peace. Lacking them for fertilizers, the soil would become impoverished. Numerous industries would be seriously handicapped. Germany was able to continue the war in 1914-18 because, though blockaded from the nitrate beds of Chile, her chemists could extract nitrogen from the atmosphere.

Their feat was a challenge that Du Pont took up in 1924. That year the company entered the synthetic ammonia business, which is second not even to dyes in its manufacturing complexities. The same plants which synthesize ammonia from coal, water and air also carry the process through to nitrogen fertilizers, while, by related processes, they turn out more than one hundred other chemical products.

If the United States today still had to send to South America for the nitrates needed for fertilizers, industry, and defense uses, thousands of tons of shipping would have to be diverted to this long haul through the Panama Canal.

However, thanks to the chemists and business managers who foresaw this contingency more than fifteen years ago, America's present nitrate problem is sim-

ply one of adding to the capacity of nitrate plants already established on American soil. In the case of Du Pont, an investment almost as heavy as that made in dyes had to be dedicated to attaining this security, and always with the possibility that large losses would result should the venture fail.

Rayon is second only to cotton in America's consumption of textile goods today. Yet only fifteen years ago rayon was "bargain-counter stuff" in the language of the retail trade. It lacked prestige. Du Pont research and vision have been leading factors in transforming it, in driving its price to a fourth of what it was, and in substantially increasing rayon-plant wages.

Cellophane But a Curiosity

Again, cellophane was little more than a curiosity fifteen years ago. It was pretty, but prohibitively expensive. Du Pont removed the faults, moistureproofed the film and introduced twenty consecutive price reductions. In consequence, cellophane marched into every store and home in the land. It ended the "Cracker Barrel" era in retailing, and became one of the most powerful allies of sanitation in the food industry.

Within six months after you bought a new car in the early 1920's, its finish was cracked and discolored. A new paint job cost $100 or more and took from a week to a month. The larger producers had as many as 15,000 cars impounded in the paint shop at one time.

What was true of automobiles was also true of almost every painted article. Piano makers spent weeks in alternately varnishing and polishing. Later, one glass of water left on the finished surface of the piano marred it. Housewives had to put heavy pads under the tablecloth at dinner to save the table's finish. Throughout industry, mass production waited upon paint and varnish to dry, at a cost to the public amounting to millions of dollars.

That is only a memory now. In 1923, Du Pont chemists invented the "Duco" cellulose lacquers. Fast-drying, tough, long-lived, they made it possible to finish a motor car in a day. With reasonable care the finish lasts as long as the car. Since introduction of these lacquers, every type of finish has been improved, a whole category of superior new finishing agents have been developed. The "Dulux" enamels which do for refrigerators and kitchen cabinets what "Duco" did for motor cars, are outstanding examples of this sweep of general change touched off in a Du Pont laboratory.

For fifty years scientists the world over tried to find a material that would be as good as rubber. They failed. Germany, which came nearest to success, practically abandoned its efforts with the end of the World War. "Synthetic rubber" was looked upon by most people as an impossible dream. However, the Du Pont management had other ideas. Without fanfare, the company's research chemists began work in 1925 to create *not* something "just as good" as rubber, but *better* than rubber. Neoprene, announced by the company ten years ago, comes close to meeting those specifications. It is compounded from such abundant raw materials as coal, limestone, salt, and water. In resisting the deteriorating action of oils, grease, sunlight, and various chemicals, it is many times superior to natural rubber. It will serve most of the uses of rubber. It costs originally more than rubber.

Neoprene is regarded as indispensable in airplane manufacture, where it has numerous uses, and it has been declared a vital defense material by the government. More than one hundred American industries are using it. It was the only non-metal material placed on the original priorities list.

This story of Du Pont developments could continue indefinitely. For more than two centuries, scientists pondered over ways to make synthetic silk, but until 1930 nobody had yet produced a truly synthetic textile fiber of any kind. It remained the most tantalizing challenge confronting research laboratories.

In that year, however, the first such fiber was drawn in a Du Pont laboratory. Its basic origin was coal, water and air. The discovery of the fiber was epochal in itself, but this one involved much more than that. The chemists actually had created a new family of raw materials, from which potentially tens of thousands of new things might be made.

They found, for example, they could produce a yarn having greater strength and elasticity than any natural product. They developed bristling filaments superior to natural hog bristles. They synthesized tough, leather-like sheets. They made another substance that in numerous respects was better than natural gut. Later, they converted the same material into fiber having properties similar to wool.

Nylon is the name given this family of materials.

Millions of American women are wearing stockings of nylon yarn. Millions, too, are using toothbrushes, as well as all kinds of other brushes having nylon bristles. Surgeons are using nylon in closing wounds. Tennis stars are playing with nylon-strung racquets.

Many Uses for Nylon

Nylon yarns and these other products did not reach a commercial stage until a year or two ago. Eight years of intensive work elapsed between their discovery and the public announcement of it. However, already in a plant erected on what was a cornfield two years ago, many hundreds of men and women are employed in the manufacture of nylon yarns. A second such factory, equally large, is now in operation. At other locations, different phases of nylon's production and procession are providing additional new employment.

Early in this article, it was pointed out that one objective of Du Pont research is to create jobs and new useful products from which the many may benefit. Nylon is the latest of the company's many actual, working examples of this.

By now, too, it should begin to be plain why there is so much emphasis on the fact that Du Pont cannot be described by any term signifying a single activity. It comes much closer to the truth to say it is "industry's industry", because in some manner the company is serving most of the basic industries of the nation, and also the nation itself.

Nylon is one of the most notable of all developments of the Du Pont company.

BETWEEN THE LINES

Already in Washington, a little group representing the solvents-reclaiming industry is planning a program which may hold potentialities for a considerable development in post-war years. It also may become a vital activity in the war effort of this country. Read what they are doing.

RECENTLY there met in Washington, without fanfare, a group of representatives of what is now a little-known industry, to plan a program that may hold potentialities for a considerable development in postwar years, and that meanwhile may become a vital activity of the war effort in this country.

This little group represented the solvents-reclaiming industry, and their meeting was the first of its kind. The program launched there, and now going forward under Government impetus, is a new one. For, as a result of that meeting, it was realized that it is possible to obtain for war and essential use, a billion pounds of solvents not now being produced for utilization, in addition to regular production.

When it is realized that already a billion pounds are being saved annually, through recovery processes, the scope of the new effort can be better understood. As S. D. Perlman, directing salvage plans for the chemical and textile industries in the Industrial Salvage Section of the Bureau of Industrial Conservation of WPB pointed out, millions of gallons of valuable chemical solvents and oils can be reclaimed for further productive use, instead of being discarded.

In view of the tremendous demand for solvents—for making smokeless powder and other explosives, for making plastics, and especially for making synthetic rubber (about 200,000,000 gallons of alcohol have been estimated as necessary for this purpose alone), recovery of any substantial amounts which can be added to available supplies has strategic significance not generally realized outside of the chemical industry.

For this reason a campaign already has been initiated designed to reach all industrial users of solvents—dry-cleaners, rotogravure printers, metal degreasers, solvent extractors, wire insulators, manufacturers in various fields—to make them acquainted with facilities for recovery or reclaiming of otherwise waste solvent material.

There is a difference, understood of course by most readers, between the terms, recovery and reclaiming; recovery implies condensation of vaporized solvents, absorption in the plant, as a part of the regular manufacturing operations. Reclaiming solvents is a different operation, and because not all plants have facilities or the technical knowledge to recover, it is expected that emphasis will be on reclaiming.

Reclaiming solvents deals with dirty solvents, variously treated to make them usable again. The process has been developed to a point where it is claimed for such transformed wastes that they are just as usable just as valuable for their purpose, as before.

The program in this field would involve hauling sludge from the producing plants, contaminated contents of vats, etc., which would be processed by distilling, centrifuging, filtering, washing, decanting, or other technique, to obtain clean chemicals.

So refined has the process become that a solvent costing for example, 20 cents, may be reclaimed for as little as 2 cents, and used again. For such uses, it is claimed, they are not necessarily limited at all, as might be inferred from the fact that they are so to speak, second-hand.

Solvents are in demand for production of so many products that a complete list can not be given here; among them, besides explosives, are artificial leather and similar substances, glassine paper, impregnated fabrics of various kinds, rayon, awnings, plastics, transparent wrappings, rubber, of course, acetate, cellulose nitrate, and for application of plastics such as phenolic resins, to other materials.

The principal types of solvents for reclaiming include alcohols, chlorinated compounds, esters, ethers, hydrocarbons, benzols, and ketones. Benzol enters production of synthetic rubber, also toluol, an ingredient of TNT. The war effort makes limitless demands on chlorine supplies. It likewise had vital uses in peace that cannot well be neglected now.

Thus, while even in mid-1940, an estimated 30-50 per cent of chlorine production was going into national defense use, approximately one-fourth of the national output in normal times was absorbed for bleaching stock by the paper industry; cleansing compounds, refrigerants, high-octane gas, purification of water, and numerous other uses absorbed still more of it, with the factor that many uses have carried over from peace to war on an even larger scale.

Thus chloroform, made in large quantities in peace, must be manufactured for war use; chlorine is a solvent widely used for fats, oils, resins, waxes, alkaloids, etc., and an important ingredient in vitamin manufacture, which under present conditions, may lead to demands for 2,000,000 pounds alone. Other pharmaceutical uses make still further demands, which cannot be curtailed.

Nevertheless, as many readers recall, chlorine has been under strict allocation, and despite pressure, many uses have been curtailed, as well as the use of chlorinated hydrocarbon solvents and others, and use of such solutions as sodium hypochlorite, and other chlorine-liberating materials.

Ranks With Water as Solvent

Alcohol is so universal in use for solvents as to rank with water. It is possible to say that scarcely a manufacturer exists in the country who does not use alcohol somewhere in his processes. Used in the first World War for munitions manufacture, for making airplane wing "dope" and for manufacture of antiseptics and medical items, production rose in 1918 to 50,000,000 gallons. The expanding uses since then, and the present prospects for its adaptation make it impracticable to even attempt to define its value, but used as a solvent alone, it enters manufacture of soaps, oils and waxes, including medicinal and mineral oils, dyes—in England severe limits have been placed on the depth of dye shades and number of such shades to conserve dyes because of scarcity of solvents entering their production; in the United States a similar shortage of various strategic chemicals is having an effect, but not as serious—alcohol is a solvent for gums and resins, perhaps a dozen products here; numerous crystalline processes, for pharmaceuticals; etching solutions and other miscellaneous uses; making tinctures, for producing essential oils in usable forms (flavorings, for instance) thinners, as in airplane dopes, and a number of purification and cleansing purposes.

Besides its other uses in preservatives, its utilitarian functions around hospitals and laboratories, and its place as a basic raw material are too well known to attempt to enumerate them. The place of alcohol as a solvent is sufficiently indicated by the drastic steps taken in recent weeks to insure sufficient supplies.

The problem, therefore is not to find uses for this, or other solvents, but to find the solvents. One of the first steps in the recovery and reclamation program will be to acquaint the solvent-producing industries—that is, the industries in which solvent materials and solvent gases are a waste-product which is normally ignored—with the need of salvaging these substances and gases, and the procedure by which they can be saved for war and essential use.

An order dealing with the subject is now being prepared, and may be promulgated before this appears. In general

(*Continued on page 104*)

The National Fertilizer Association

18th Annual Convention

By
James M. Crowe
Assistant Editor

Dr. Elliott addresses annual convention dinner

The fertilizer industry is a vital link in the production line. With crop goals set far in advance of anything in the past, this country in 1941 used more fertilizer than ever before. In spite of the great demands and the many problems incident to production and transportation of essential raw materials and finished products the industry believes it will meet the test of the present war emergency.

THE preservation of our soils and their fertility should be among the important tasks of the nation. Every element in our civilization owes a responsibility to the present and to the future generations toward this end. It is the specific function and purpose of the fertilizer industry to assist in this work of preserving and improving our soils, and to enable the farmer to produce his crops at the lowest possible cost per unit. The National Fertilizer Association has not failed to make its contribution toward the fulfilment of these obligations.

And now when the United States has become a supply house for a good part of the world, the fertilizer industry must feed the soil that feeds the nations that will win the war.

It was with these serious thoughts that more than 350 leaders of the fertilizer industry gathered for their 18th annual convention at Hot Springs, Virginia, June 18-20.

The meeting opened Thursday morning with registration and a meeting of the Board of Directors.

On Friday morning the attendees convened for the first general session.

After the song "America" was sung and the invocation given by the Rev. George W. Oldham, President John A. Miller gave the annual convention address entitled, "The Place of the Fertilizer Industry in the War Program." He said in part:

"The slogan of the World War I was "Food Will Win The War". Undoubtedly, the slogan that has been adopted for the present conflict is "Production Will Win the War". Our industry has a most important place in the production line, certainly, second only to those industries producing the actual instruments of war. Not only must we assist the farmers of this country to feed our armed forces at the four corners of the earth and our people at home, but also there must be supplied enormous quantities of food stuffs for our allies. Recognizing the importance of food production, Secretary of Agriculture Wickard, has set crop goals far in excess of any that have been attained in the past.

President Miller

"It has been estimated that fully 15 per cent of our crop production is directly the result of the use of commercial fertilizer. Were it not for fertilizers, we would have to cultivate 30,000,000 more acres in order to attain our present crop production. During the calendar year 1941, this country used more fertilizer than ever before—9,264,000 tons which is almost a million tons more than was consumed in the preceding 12 months. For the fertilizer year ending June 30, 1942, we will have produced approximately 6,300,000 tons of superphosphate (basis 16 per cent) which is again about a million tons more than for the 12 months ending June 30, 1941. Domestic production of potash has increased to such an extent that the needs of industry are fully taken care of and there is an adequate supply for use as fertilizer.

"As is well known to all of you, the nitrogen situation is another story, but it can reasonably be assumed that any shortage in the nitrogen supply that may develop will not be crippling in the effect. We had a considerable shortage of top-dressing nitrogen materials in some sections of the country this past spring season.

"The industry must assist the Government in every possible way to see that all available plantfood that can be produced is used most advantageously in the country's overall interest. Individual advantages must and will be cheerfully subordinated to our National needs. With greatly increased farm income and higher production goals to be striven for, it would appear that next year the consumption of fertilizers may rise to another all-time high.

"We cannot overlook making some reference to Government regulations and proposals that vitally affect our industry and its operation. The Price Ceiling Regulations which have been issued are well known to all of you. In certain instances, they may seem inequitable and impossible of operation in the face of increased costs such as freights and wages, but war was ever unfair and disrupting, and unless we adjust ourselves to the emergency which confronts us we may find that further dislocation of our ordinary procedure is imperative. We are accustoming ourselves to the present situations, and it is our opinion that if unreasonable and unworkable regulations seem to have arisen, the means of ameliorating them will be found, as all those in Government with whom we deal are

acquainted with our problems and we have not *yet* been asked to do the impossible.

"The industry has been more seriously handicapped recently by the diversion of all liquid forms of ammonia from the manufacture of mixed fertilizers. The lack of such liquors makes it extremely difficult to manufacture acceptably the grades of fertilizer to which the American farmer has become accustomed. We are, therefore, forced to ponder seriously over the problem of obtaining satisfactorily conditioned mixed fertilizers by the means at our command. Of very serious portent, too, is the suggestion that anhydrous ammonia may be diverted from sulfuric acid plants using the chamber process. To return to the potting of nitrate of soda would require a considerable tonnage of iron and in some cases will probably reduce the tonnage of acid produced.

"You are all familiar with the fact that there has been a wide-spread and persistent rumor among farmers that fertilizers are to be rationed next season. Numerous conferences have been held in Washington on this subject. At the present time, it appears that the outlook for raw materials from which to make fertilizers, including nitrogen-bearing materials, is sufficiently encouraging to indicate that rationing to the farmer will not be necessary. Neither the Government, farmers, nor the fertilizer industry wants fertilizers to be rationed, but if a grave and unforeseen shortage in nitrogen should develop later, it may be advisable to introduce some form of rationing to insure the best use in the national economy of such nitrogen as is obtainable. Practically all of us had some experience this past spring in rationing nitrogen to a limited extent. If and when rationing does become necessary, the fertilizer industry through its thousand factories and its 50,000 agents and dealers has an organization capable and ready to carry out such procedure as may be necessary most expeditiously and with little or no expense to the Government.

Helping Government Agencies

"At the request of the War Production Board, the Office of Price Administration, and the Office of Agricultural War Relations of the U. S. Department of Agriculture, the Association arranged and held this spring nine regional meetings throughout the country in order that the Government might have an opportunity for its representatives to present personally to the various agricultural agencies, both State and Federal, and to the fertilizer industry, the many perplexing problems that present themselves in connection with the production and distribution of plantfood. To these meetings were invited the representatives of the land grant colleges and agricultural experiment stations, the extension service, State departments of agriculture, members of the State and County war boards, county agents, and all members of the fertilizer industry. In all, over 900 people attended these meetings and heard authorized Government officials discuss such topics as the allocation of nitrate of soda, price ceilings, preference ratings on repairs, bags, agricultural crop goals, available supplies of fertilizer raw materials, and transportation. It is felt that a much better understanding was reached as to the reason for certain orders that were issued and as to what might be done to assist in the accomplishment of desired results.

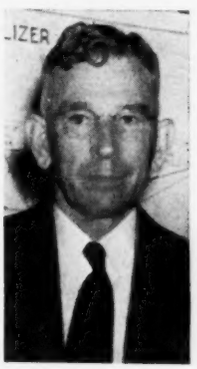
"At the request of the U. S. Department of Agriculture, the War Production Board, and the Office of Price Administration, we have called meetings of agronomists for the purpose of recommending a reduced number of grades and the most economic grades to be sold during the next fertilizer year. Industry-farm group meetings will also be called for this same purpose, and agronomists, representatives of farm organizations, and all interested parties will be asked to attend.

"At the request of WPB, OPA, and OAWR, the Association informs all members of the industry, whether members of the Association or not, of meetings of the Fertilizer Industry Advisory Committee and its subcommittees, and of any other vital matters affecting the industry as a whole. Such a meeting of the industry committee was held in Washington as recently as June 11. At the request of one of these agencies, the Association has reproduced and mailed, within the day, to all fertilizer producers, a letter giving urgent and important information. Allocation and price ceiling orders have been reproduced and mailed the same day as published. To render such service we believe to be the Association's duty, and it is being performed cheerfully and quickly to the best of our ability.

"Individually and collectively, the people of these United States are in this war to win it. Our industry is an important cog in the production machine, and whatever service is required will be rendered enthusiastically; whatever sacrifice—will be cheerfully accepted."

Fertilizer Man in the Future

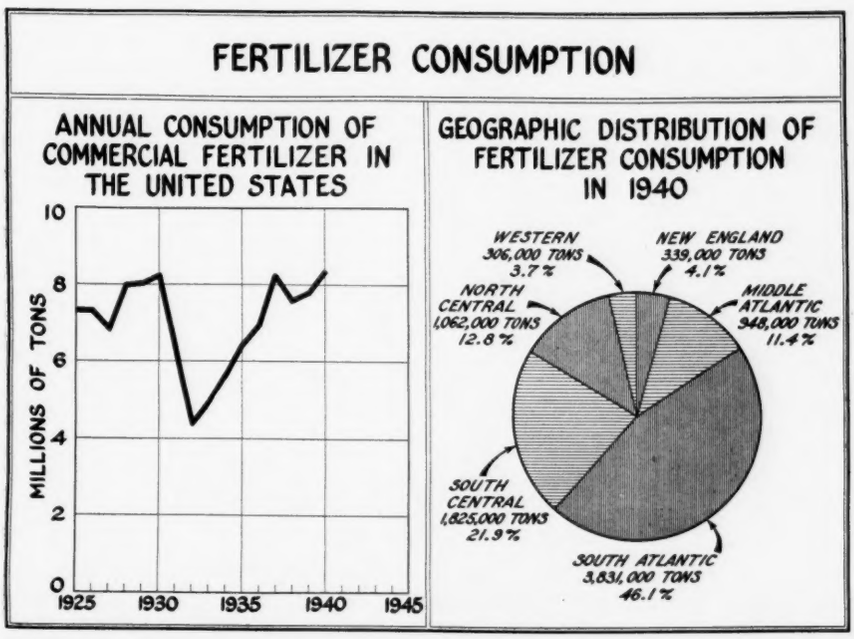
Dr. Clarence Poe, President and Editor, the Progressive Farmer of Raleigh, N. C., was the next speaker with "The Fertilizer Man in the New Day: His Duties and Opportunities in Relation to Southern Agricultural Progress and the National Welfare."



Dr. Poe

Dr. Poe said "While service and not exploitation would seem to be the world's keynote in the year just ahead, I do not wish to see the Government take over all the functions of private business. I fear that without competition and the profit motive retrogression and dry rot would set in, in many fields of production and industry.

"The best type of fertilizer man is indeed a co-worker with the agricultural colleges, the United States Department of Agriculture, and the experiment stations of the South and of America. He



can not only make two blades of grass or two ears of corn grow where one grew before, but he can feel that he is promoting the achievement of this result by providing for each crop and each soil just the sort of plantfood which will give maximum production at minimum cost. He can take pride in the fact that through the efficiency and economy of the fertilizer industry he could sell fertilizer last year at 96 per cent of prewar prices and this year at 111 per cent, when commodities generally averaged much higher than 96 per cent last year and 111 this year."

Dr. Poe then went on to say that "In the past, the Southern farmer has received only about $20 from livestock as compared to $100 from crops; while in the richest agricultural states the income from each of these sources is about the same. Now in many sections, pastures, feed crops, and legumes are providing better markets for fertilizers than was ever provided by the tenant on eroded land raising only cotton. While producing cotton alone may give the farmer a living, cotton plus livestock may give him prosperity."

Government and Industry

T. E. Milliman, Chief of the Agricultural Chemicals Section of the WPB in the next talk, "Government—Fertilizer Industry Hitch-up", stated that the interests of farmers can be served best in so far as the distribution of needed crop fertilizers is concerned, by full cooperation between the various agencies of Government, the State Land Grant Colleges and the fertilizer industry.

T. E. Hillman

In discussing the nitrogen problem Mr. Milliman states "There is a shortage of chemical nitrogen. The supplies of superphosphate and potash have been adequate to meet all needs. The prospect for these two materials for the coming fertilizer year is favorable. Moreover, the shortage of total nitrogen is not as great as it seems, a situation which is due to the almost certain existence of a greater surplus of cotton seed, soy bean and peanut meals over feeding requirements than has ever existed. The feed trade estimates that this prospective surplus will be considerably greater than the last reported figures of the Government. We may then reasonably count upon partial alleviation of the nitrogen shortage by more liberal use of seed meals as fertilizers along with the customary by-product fertilizer organics such as nitrogenous tankage, castor meal, dried ground tobacco stems, garbage tankage and processed sewage. Ways must be found to incorporate seed meals and other organics into fertilizers to the extent that the farmer is willing to buy them when so incorporated, without removing the opportunity from the farmer to buy fertilizers of lower nitrogen content minus the addition of unusual amounts of organic material. As a corollary it should be stated that farmers should be encouraged to use seed meals for direct application or mixing whenever they prefer to do so at a lesser cost than to buy them already incorporated with other plant foods. Let the farmer have the choice of any of these means of using additional organics.

"The shortage of chemical nitrogen for the next fertilizer year is unknown. Sulfate of ammonia will be in plentiful supply, with driblets of cyanamid. The variable factor is nitrate of soda, the future supply of which cannot be measured with assurance at this time. The total supply of chemical nitrogen expected to be made available to the fertilizer industry will, if and when combined with the usual organics and the excess supplies of seed meals, result in what is now considered to be a comparatively mild shortage. Remember, if you will, that in the fiscal year now closing more chemical nitrogen has been made available for fertilizer use than in any other year in the history of fertilizer. Readjustments of ratios and grades, and economy in the use of nitrogen materials for direct-application, are considered sufficient to carry the American farmer through to the largest crop production in history for 1943."

Secretary's Report

The last address of the Friday morning session was "Our Association: A Brief Report" by Charles J. Brand, Executive Secretary and Treasurer. Mr. Brand told of the foundation of the association eighteen years ago, and of its many worthwhile accomplishments since that time. He said, "On June 11, 1925, the organizing committee, created to weld the old Southern Fertilizer Association and the old National Fertilizer Association into one truly national body, completed its work. After a full year of preparation, what is now the National Fertilizer Association adopted a carefully prepared set of by-laws, a constructive program of work, and a budget adequate for doing a great industry service.

Charles J. Brand

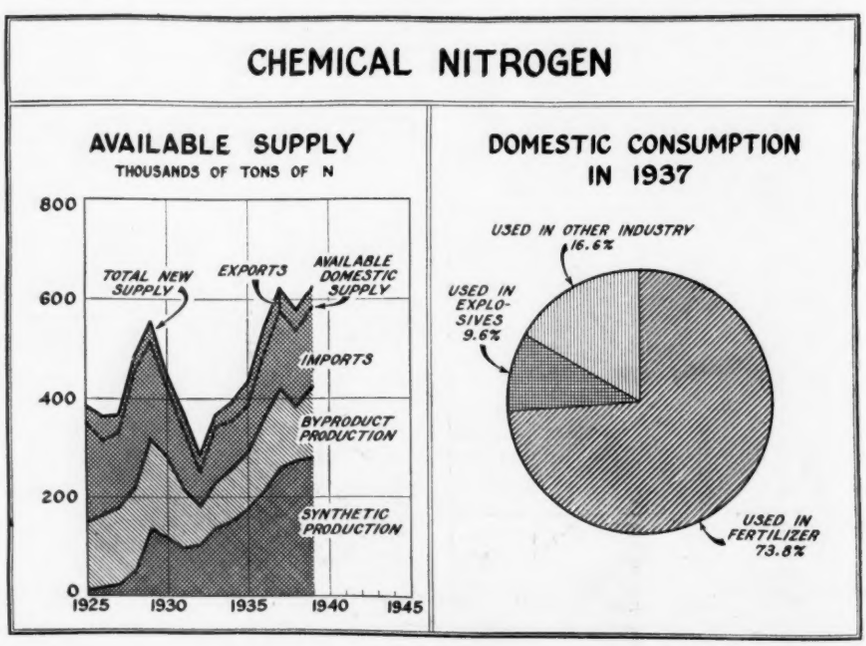
With regard to membership, Mr. Brand stated:

"On June 16, 1942, when this was written, we had 271 active members, which is just 124 more than we had at the start, and four more than the average; and 63 associate members, almost exactly what we had in 1925, a total of 334.

Mr. Brand then told of the work that has been done during the past seventeen years and said that because of such a background the association is now able to give Government agencies dealing with war emergency problems, information concerning the industry and the use of fertilizers which is helpful to the entire production program.

After Mr. Brand finished, John A. Miller submitted the budget for the com-

(*Continued on page* 105)

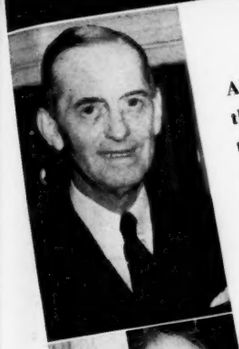


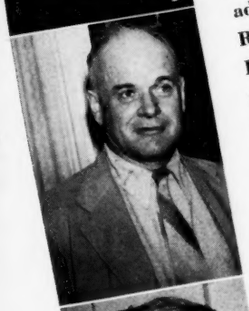
Fertilizer Leaders Discuss

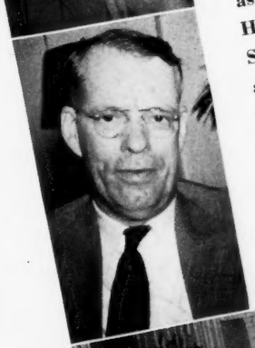
TO the spacious Homestead at Hot Springs, Va., last month went three hundred and fifty leaders of the fertilizer industry, with serious thoughts of the problems inflicted upon them by war, for the eighteenth annual convention of the National Fertilizer Association, Inc.

From June 18 to 20, the problems of the fertilizer industry in assisting the work of preserving and improving our soils, and enabling the farmer to produce his crops at the lowest cos magnitude of the job become food supply s world—were reviewed

Chemical Industries this important conventi pages 54 to 56. He to alities at the conventio golf links over the thr







Above, view of the Homestead from the 18th green of the golf links. The three gentlemen at the left (from top to bottom) are: H. B. Baylor, International Minerals & Chemical Corp., Chicago, who is vice-president of the association; G. J. Callister, assistant administrator, Fertilizers, Ottawa, Canada; E. A. Simpson, Consolidated Rendering Co., Boston.

In the three groups below (from top to bottom) are: (top photo) left to right, C. D. Shallenberger, Shreveport Fertilizer Co.; John E. Sanford, Armour Fertilizer Works, Atlanta, Ga.; Leon H. Davis, Southern Cotton Oil Co., New Orleans, all directors of the association Center photo, left, J. E. Henderson Jr., H. J. Baker & Co., Savannah, and Robert S. Cope, Reliance Fertilizer Co., Savannah. Bottom photo, left, A. W. Higgins, A. W. Higgins Co., Presque Isle, Me., and A. L. Tichane, American Cyanamid Co., N. Y.

W. D. Wright, St. Regis Paper Co., and John E. Powell, Smith Agricultural Chemical Co., Columbus, O.

J. F. Benton, Combustion Engineering Co., Chicago, and E. A. Mosley, Babcock & Wilcox Co., N. Y.

Ernest S. Russell, Old Deerfield Fertilizer Co., Deerfield, Mass., and B. B. Fall, Rogers & Hubbard Co., Portland, Conn.

Left to right, W. H. Logan, Logan-Robinson Fert. Co.; J. Russel Porter, American Potash & Chemical Corp., Atlanta; and W. H. Moore Jr., Logan-Robinson Fertilizer Co.

W. C. Stark, Atlantic Fertilizer Corp., Riverhead, N. Y., and C. B. Dunne, French Potash & Import Co., Inc., N. Y.

Left to right, George W. Inc., Anderson, S. C.; J. W erals & Chemical Corp., Potash Co., Carlsbad, N. M.;

Left to right, James MacBe Chester S. Edwards, Nitrog ican Potash Inst.; Harry

A. H. Carpenter, Armou and W. S. Rupp, Baugh C

Left to right, Douglas Kell Fred F. Coffee, Armour Caldwell, Southern Shippi

John A. Miller and Travis Special Machine Co.

J. D. Morgan, Morgan Bros Mfg. Co., and W. E. Barrett,

Discuss War Role

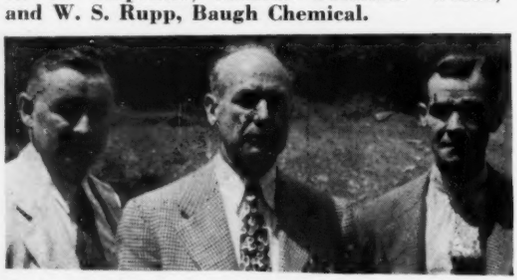
crops at the lowest cost per unit—plus the increasing magnitude of the job now that the United States has become food supply source for a great portion of the world—were reviewed by the experts.

Chemical Industries sent one of its editors to cover this important convention and you can read his story on pages 54 to 56. He took these photographs of personalities at the convention at regular sessions and on the golf links over the three-day period.

Left to right, George W. Gage, Anderson Fertilizer Co., Inc., Anderson, S. C.; J. W. Rutland, International Minerals & Chemical Corp., Atlanta; T. M. Cramer, U. S. Potash Co., Carlsbad, N. M.; R. B. Douglas, Smith-Douglas.

Left to right, James MacBeth Jr., Jones & Laughlin Steel; Chester S. Edwards, Nitrogen Prods.; G. N. Hoffer, American Potash Inst.; Harry Appleby, Sylacauga Fertilizer.

A. H. Carpenter, Armour Fertilizer Works, and W. S. Rupp, Baugh Chemical.



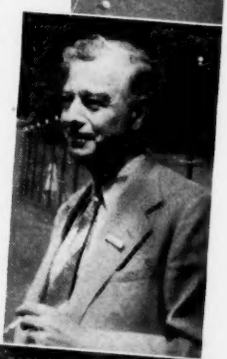
Left to right, Douglas Kelly, Armour Fertilizer; Fred F. Coffee, Armour Fertilizer, and N. F. Caldwell, Southern Shipping Co.

John A. Miller and Travis S. Whitsel, Union Special Machine Co.

J. D. Morgan, Morgan Bros., Richmond Bag Mfg. Co., and W. E. Barrett, Richmond Guano.

Above, first green. At the right, the four gentlemen from top to bottom are: F. J. Woods, Gulf Fertilizer Co., Tampa, Fla; J. B. Pratt Jr., H. J. Baker & Bro., N. Y.; F. G. Sherry, H. J. Baker & Bro.; J. W. Wizeman, WPB.

In the six shots below, the top strip, from left to right, shows: T. V. Hough, Kershaw Oil Mill, Kershaw, S. C.; W. G. Taylor, Catawba Fertilizer Co., Lancaster, S. C.; and putting, A. McLintock, Texas Gulf Sulphur Co., N. Y. Bottom strip shows, from left to right: R. I. LaMarche, Bagpak, Inc., N. Y.; S. J. Martenet, E. Raugh & Sons Fertilizer Co., Indianapolis; W. J. Danis, Werthan Bag Corp., New Orleans, La.



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PAPER BAGS (all types)

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PASTED VALVE • PASTED OPEN MOUTH
Printed or plain, as you desire, together with the correct type of spout for each type of bag.

WATER-REPELLENT All-Weather Kraft is the standard sheet in the construction of all our Fertilizer bags whether you specify it or not, *at no extra charge*. For hygroscopic materials, our Lamina sheet (asphalt laminated) is incorporated as an inner ply.

When asked for our opinion, as to the bag best suited for fertilizer, we unhesitatingly recommend Sewn Open Mouth bags with our Cushion Stitch form of closure. A thick cord forms a cushion, or shock absorber, that takes up the strain and prevents the stitching from pulling through the bag walls.

Closing Equipment

Bagpakers to fit any purse. Our "F" type that can be set up over your own conveyor; our semi-automatic "DA" type complete with conveyor and tape applicator; or if your production is large enough to warrant, our large fully automatic "A" type Bagpaker, — a full cycle unit that weighs, fills and closes the bags at the rate of fifteen 100-lb. bags per minute with only one operator, is also available.

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Fulton WATERPROOF Bags WITH Diastretch LININGS

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FULTON Waterproof Bags with special Diastretch linings are the ideal shipping containers for chemical and mineral products that need moistureproof protection. They are exceptionally strong and easily handled. Large shippers are replacing more expensive containers for an increasing number of products that require a moistureproof, dirtproof and siftproof package and are using FULTON Waterproof Bags with gratifying results. Wherever moisture with resulting lumping or caking is a factor in transit or storage Fulton Waterproof Bags can fill your needs. Dry chemicals and mineral products look better and sell better . . . they carry and store safely in these light but tough containers that effect worthwhile economies in handling. The use of waterproof bags means a large saving in cost, in freight and in storage space as compared with rigid containers. Supplies are available in proportion to your 1941 purchases or in larger amounts on priority orders A 1 J, or higher.

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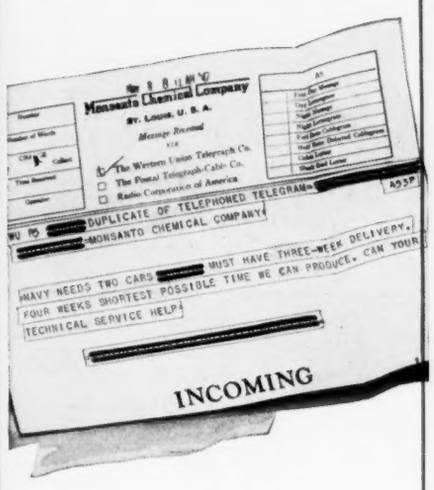
The Navy asked the impossible—and got it...*in a week!*

One of a series of cases from the files of Monsanto's Technical Service Department which show how skill, experience and ingenuity can solve many critical wartime production problems. For obvious reasons names and any identifying clues have been omitted.

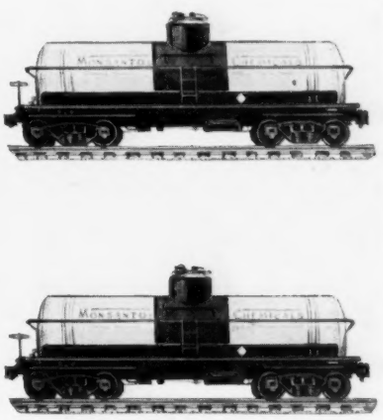

Monsanto Chemical Company
St. Louis, U. S. A.
Message Received
The Western Union Telegraph Co.
The Postal Telegraph-Cable Co.
Radio Corporation of America
DUPLICATE OF TELEPHONED TELEGRAM
MONSANTO CHEMICAL COMPANY
NAVY NEEDS TWO CARS [redacted] MUST HAVE THREE-WEEK DELIVERY.
FOUR WEEKS SHORTEST POSSIBLE TIME WE CAN PRODUCE. CAN YOUR
TECHNICAL SERVICE HELP?
INCOMING

1. This is the wire a hopeful sales correspondent recently marked "RUSH—Technical Service, please handle!" It was signed by a Monsanto customer of long standing.

[redacted] was a product manufactured by the customer largely from raw materials supplied by Monsanto. To produce the quantity needed and to meet Navy specifications would ordinarily require a series of relatively simple but time-consuming operations.

2. But in two days Technical Service had worked out a new manufacturing process telescoping several of the previous steps into one...on the third day production was started . . . and within a week, two tank cars of the product were on their way to the Navy, *two weeks ahead of the specified delivery date!*

Obviously not all the problems referred to Monsanto Technical Service these hectic days are so quickly or happily solved.



3. You will find, however, that two factors often give Monsanto technical men a head start towards a solution; (1) a thorough understanding of *your* basic problems; (2) a broad knowledge of their *own* business which springs from the very breadth and variety of Monsanto's chemical manufacturing experience. Finally, you will find them especially eager to help on war production problems. MONSANTO CHEMICAL COMPANY, St. Louis, U. S. A.

MONSANTO CHEMICALS

"E" for Excellence...denoting the highest service accomplishment of the United States Navy...flies over Monsanto "in recognition of production of ordnance materiel vital to our national defense." In addition to the Ordnance flag and "E" pennant, at left, Monsanto has now been awarded the All-Navy "E" burgee "for excellence in war production."

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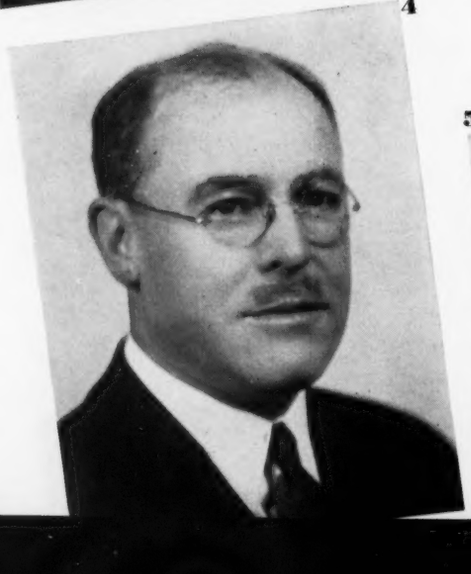

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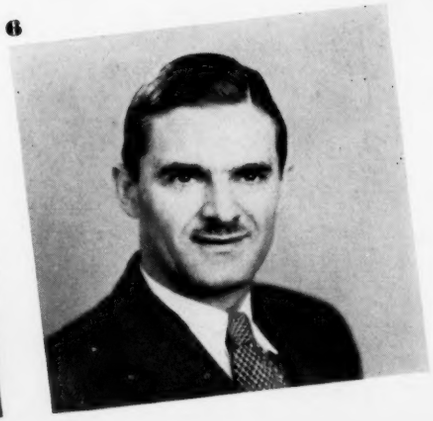
Headliners in the News

(1) George W. Perkins has resigned as executive vice-president of Merck & Co. to enter active service with the Chemical Warfare Service as a Lieutenant Colonel. (2) Dr. Nelson Allen, research supervisor of the rayon division of Du Pont, Buffalo, N. Y., has been named general chairman of the 104th meeting of the American Chemical Society to be held in Buffalo, Sept. 7 to 11. (3) E. W. Ritter has resigned as vice-president in charge of manufacturing and production engineering for RCA to become assistant to the president of Corning Glass Works. (4) Dr. E. A. Rykenboer, general manager of the Electrochemicals Department of Du Pont, completed 25 years of service with the company July 2 and was given a dinner in his honor by Du Pont's Niagara Falls 25-Year-Club. (5) Edmund E. ("Benzoate") Smith last month celebrated his 25th anniversary with the Seydel Chemical Co., Jersey City. (6) Charles A. Mabey has been appointed director of the research activities of the Bristol Co., Waterbury, Conn. For the past several years he served as physicist for the organization. (7) Above photograph, radioed from Moscow to the Russian War Relief in New York, shows part of a shipment of New York Quinine & Chemical Works products being loaded on a Red Cross truck bound for a front line hospital.

5



6

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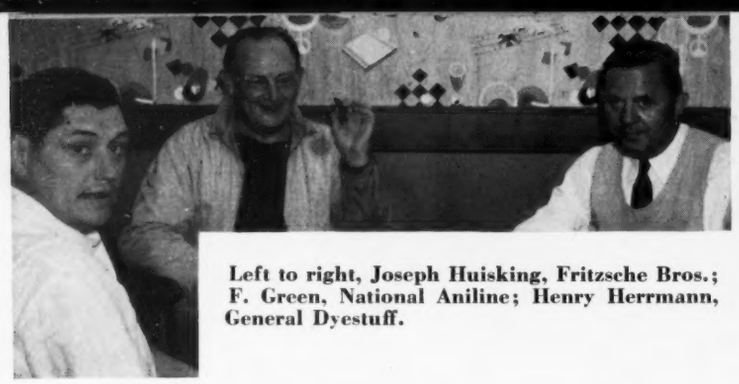
Gas Absorption	Polymerizing	Emulsification
Solvent Extraction	Evaporation	High Pressure Processing
Solvent Recovery	Crystallization	Impregnating
Heat Transfer	Drying	Gas Cleaning
Furnacing	Mixing and Stirring	and others
Cracking		

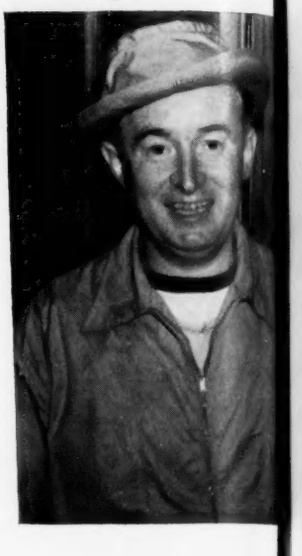


Left to right, Joseph Huisking, Fritzsche Bros.; F. Green, National Aniline; Henry Herrmann, General Dyestuff.

Dr. Eugene McCauliff, Industrial Synthetics, and E. J. Maguire, Grasselli Chemical Div., Du Pont.

Salesmen's Association Holds First Golf Tournament at Garden City

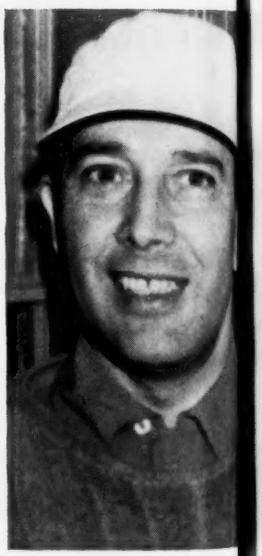
First golf tournament of the Salesmen's Association of the American Chemical Industry was held June 2 at the Garden City Country Club, Garden City, L. I. Charles Alexander, Seldner & Enequist, took first prize for low gross. Next tournament will be held July 14 at Bonnie Briar Country Club, Larchmont, N. J.



Frank Fanning, N. I. Malmstrom & Co.

Left to right, Milton Maybaum, National Oil & Supply; A. R. Rodway, A. R. Rodway Co.; and Fred A. Koch, Dow Chemical.

(Left) James J. McInnes, Jr., Commercial Solvents; and Charles Alexander, Seldner & Enequist.



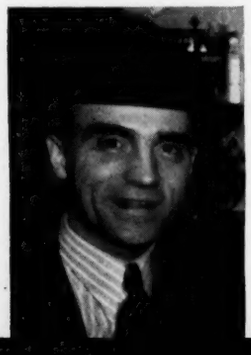
Philip J. LoBue, Michigan Chemical.

J. E. Bonnabeau, Barrett Co.

H. B. Bercow, H. H. Rosenthal Co.

Charles W. French, Jr., Oldbury Electro-Chemical Co.

Harold W. Feuchter, J. T. Baker Chemical Co.



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COMMERCIAL RUBBERMAKERS' SULPHUR, Tire Brand, 99½% Pure
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Whatever your chemical needs are on Synthetic, Reclaimed or Natural rubbers, Stauffer Rubbermakers' Sulphurs or Chemicals will meet your most exacting requirements. Stauffer has been supplying the rubber industry since the turn of the century and has ample facilities to meet the increased demands of war production.

OTHER STAUFFER CHEMICALS: Borax • Boric Acid • Citric Acid • *Commercial Muriatic Acid • *Commercial Nitric Acid • *Copperas • Cream of Tartar • Liquid Chlorine • *Nitrate of Potash • Silicon Tetrachloride • Sodium Hydrosulphide • Stripper, Textile • *Sulphate of Alumina • Sulphuric Acid • *Superphosphate • Tartaric Acid • Titanium Tetrachloride • Tartar Emetic.

*Items marked with star are produced on West Coast only.

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STAUFFER CHEMICAL COMPANY

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FREEPORT, TEXAS APOPKA, FLORIDA

"some played baseball"

1

2

3

4

"some pitched horseshoes"

5

"some went swimming"

11

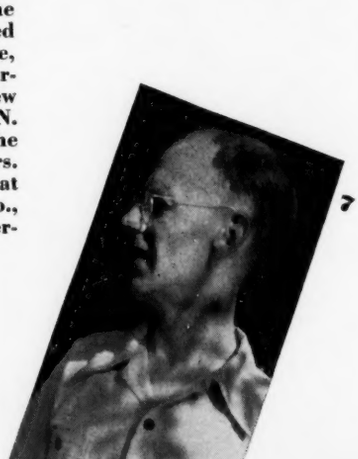
6

Chemical Engineers Hold Annual Outing at Westport Mill Laboratory of Dorr Co.

Annual outing and picnic of the N. Y. Section of American Institute of Chemical Engineers and the Junior Chemical Engineers of New York was held June 20 at the Westport, Conn., laboratory of the Dorr Co. About 70 were present for a day's entertainment which included a barbecue picnic, inspection of the laboratory, swimming, boating, paddle tennis, horseshoe pitching and baseball.

(1) Lt. J. G. Raymond Devoluy, now of the U. S. Navy and formerly of American Cyanamid, bats for the Junior Chemical Engineers. (2) C. V. Holland, Merck & Co., pitches against (3) Emerson J. Lyons, Turbo Mixer Corp. (4) Gordon MacLean, Allied Molasses, tosses a ringer. (5) W. E. Burkhard, Merck & Co., and his wife pose among the flowers and trees. (6) Harry E. Outcalt, St. Joseph Lead, who chairmanned the affair for the A.I.Ch.E. (7) Dr. E. C. Roberts, of the Westport Laboratory of the Dorr Co., who helped with arrangements for transportation, barbecue, etc. (8) Mr. and Mrs. Anthony Anable (advertising manager, Dorr Co.) await the train to New York after a very enjoyable day. (9) Dr. J. V. N. Dorr, host of the day, tells George Darby of the Dorr Co. that it was a good affair. (10) Mrs. J. V. N. Dorr served the delicious baked beans at the barbecue lunch. (11) A. D. Camp, Dorr Co., is off for the dressing room after a record underwater swim.

"transportation was provided"



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THE STORY OF SODIUM IRON PYROPHOSPHATE

($Na_8Fe_4(P_2O_7)_5.XH_2O$)

SEVERAL years ago, a Victor research chemist, diligently exploring in an uncharted field of phosphates, prepared a compound with the formula $Na_8Fe_4(P_2O_7)_5.XH_2O$. It proved to be a light tan crystalline product, insoluble in water but soluble in dilute hydrochloric acid, and had an iron content of 15.5%.

No practical use could be found for the product at the time . . . so it was simply filed away along with many other similar phosphorus "curiosities." Some day, perhaps, a role in modern industry would be discovered for it.

Sodium Iron Pyrophosphate did not have long to wait. But a few months later found food product manufacturers devoting considerable attention to the fortification of flours, cereals, and other staple foods with those vitamins and minerals of which there is a recognized deficiency in the average American diet.

In the list of desired minerals was iron . . . a mineral that had long been regarded with considerable apprehension by food product manufacturers. Experience clearly indicated that traces of this common element prompt oxidation of fats, thereby resulting in a rancid, unpalatable flavor.

Called upon for assistance in solving the problem, the chemists in Victor's cereal research laboratory immediately brought out all the samples of iron compounds they had ever made . . . launched a series of keeping tests with various cereals. Characteristic rancidity quickly developed in each . . . with one astonishing exception.

Week after week, month after month, the flours containing Sodium Iron Pyrophosphate continued to remain sound. Tests were broadened to include a wide variety of flours, particular attention being given to those known to be especially susceptible to rancidity. In each instance, the same incredible results were duplicated.

Sodium Iron Pyrophosphate had come into its own! It has made iron enrichment of cereals practical. Already thousands of cases of breakfast cereals, millions of barrels of flour, tens of millions of loaves of bread have been enriched with this essential mineral.

Have you a problem? Perhaps one of the many obscure phosphorus compounds in our constantly expanding collection of chemical "curiosities" may solve it for you. Its unique properties may duplicate exactly the specifications of a product you are seeking. If not, it is altogether possible that such a product can be produced . . . phosphorus offers a seemingly endless variety of combinations with other common elements.

For years Victor Chemical Works has specialized in phosphates, formates, and oxalates . . . today is the world's leading producer of these compounds. During these years, it has been our privilege to help industry solve many important problems with phosphorus compounds, formates, and oxalates. May we serve you, too?

VICTOR
Chemicals
(In Commercial Production)

- Phosphoric Acid
- Pyrophosphoric Acid
- Polyphosphoric Acid
- Phosphorus
- Phosphorus Oxychloride
- Phosphorus Trichloride
- Phosphoric Anhydride
- Alkyl Acid Orthophosphates
- Ammonium Phosphates
- Alkyl Ammonium Phosphates
- Fireproofing Compounds
- Calcium Phosphates
- Magnesium Phosphates
- Potassium Phosphates
- Sodium Phosphates
- Sodium Pyrophosphates
- Potassium Pyrophosphate
- Alkyl Acid Pyrophosphates
- Formic Acid
- Aluminum Formate
- Sodium Formate
- Sodium Boroformate
- Oxalic Acid
- Calcium Oxalate
- Sodium Oxalate
- Magnesium Sulphate
- Sodium Aluminum Sulphate
- Ferrophosphorus

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We offer the services of an experienced staff of technicians to help you make your raw materials go farther. Skilled in the use of Diamond Alkali products for a wide variety of applications, these experts help make most effective use of not only alkalies, but of other materials as well. Thus they can assist you in one of your most vital obligations today—conserving America's resources!

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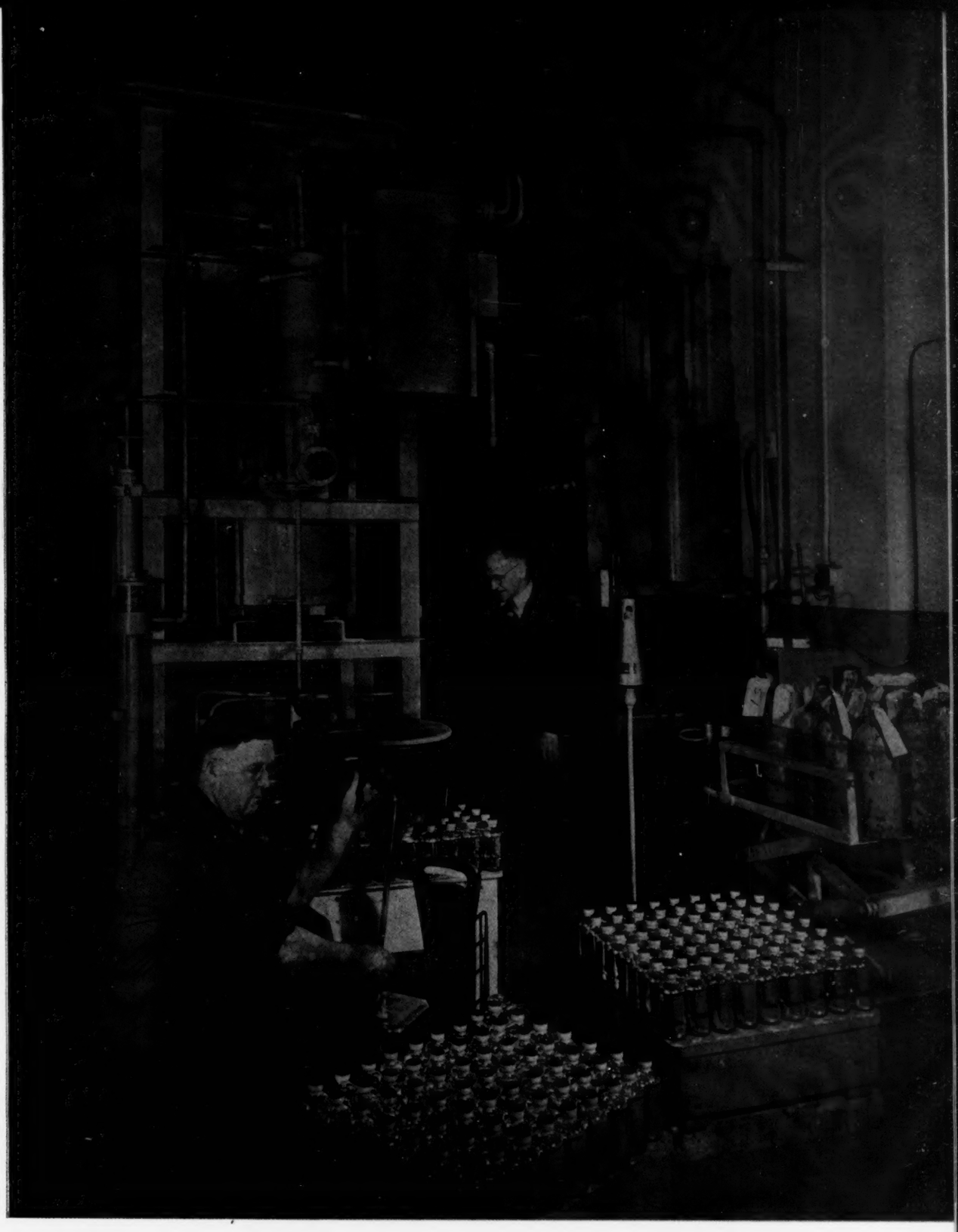
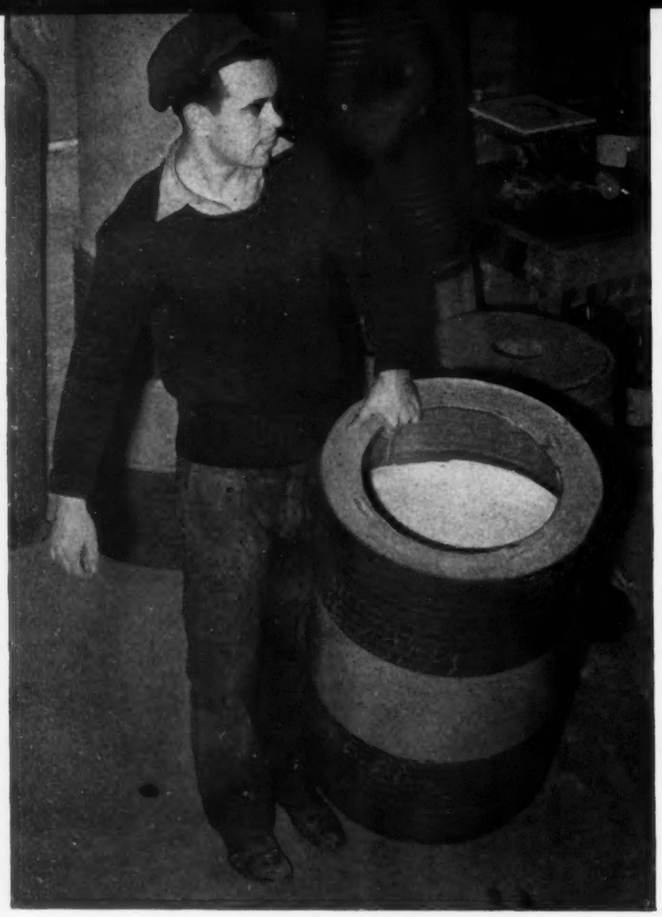


NEW CHEMICALS FOR INDUSTRY

Mercury, 99.99995% pure, is being prepared in this GE laboratory at the rate of ½-ton daily. Product of this purity is required for reliable operation of electronic tubes providing power for manufacture of aluminum and magnesium. Raw mercury is treated with nitric, distilled in tower and then collected.

Digest of Chemical Developments in Converting and Processing Fields

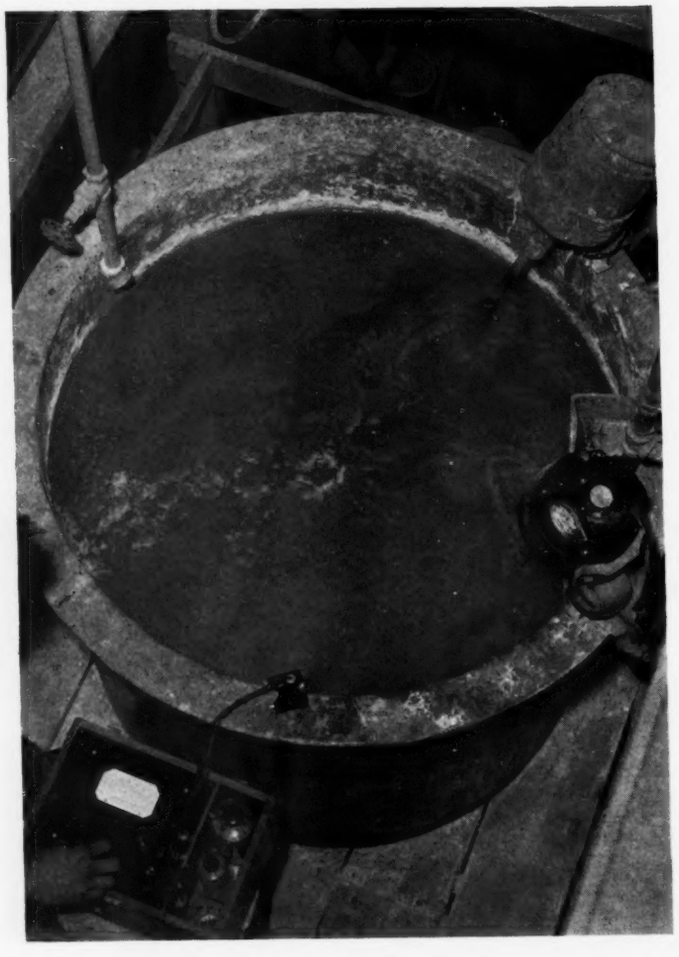


Manufacture of Silica Aerogel

By John F. White
Monsanto Chemical Co., Merrimac Division

This paper was presented at the Joint Symposium of the A.I.Ch.E. with the Heat Transfer Division of the American Society of Mechanical Engineers at the Boston meeting, May 13. It gives the basic theory underlying the method of producing aerogels and a general outline of the process.

Top photo shows drums of Monsanto's "Santocel." Note the extreme lightness of the product. Below, mixing tank showing one of the steps in preparation.



THE method of preparing aerogels, the theory underlying the method and some of the novel characteristics of matter in the aerogel form have been reported in some detail in the literature.[1, 2, 3, 4, 5, 6, 7, 8] More recently, one of these aerogels, namely silica aerogel, has assumed commercial significance. Pilot plant operations have been concluded and the first large scale production unit is now being operated.

The process is built around one essential unit operation involving a more or less unique step, i.e., the heating of a gel system to temperatures and pressures above the criticals for the liquid phase present in the gel. Although the other unit operations of the process involve factors of engineering interest, these operations are of a familiar nature and it is not the object of this paper to report on them. Therefore, the scope of this article is confined to a discussion of the engineering problems connected with the heating of the gel above the critical temperatures and pressures. However, in order that the conditions of this operation may be better visualized, a brief resume of the theory and a general description of the process are given.

Theory

A silica aquagel, formed by the action of an acid on sodium silicate consists of a continuous solid phase and a continuous liquid phase. The solid phase consists of a felted structure of SiO_2 fibers with the liquid phase being held between these fibers. If such a gel is dried at normal pressure a very marked shrinkage takes

Lump of unground silica aerogel held up to light to show its translucency.

place and the resultant product is a heavy, hard glass-like mass. The shrinkage is caused by the formation of a gas-liquid interface within the gel pores during the evaporation of the liquid. Surface tension forces existing at this interface are sufficient to cause the fibers to pull together, or compress, until the structure is closely enough knit to withstand those forces.

If the gel is heated under sufficient pressure to prevent evaporation within the gel then no gas phase forms until the critical temperature of the liquid is reached. At this point the liquid phase may be said to be converted to the gaseous phase instantaneously, thus avoiding a gas-liquid interface. Once the gas phase has been reached, the gas may be withdrawn without causing any collapse of the solid structure. The resultant product is a light, friable, slightly opalescent solid containing as much as 95% air by volume. Silica aerogels having densities as low as 1.8 lbs. per cu. ft. have been produced. Since colloidal SiO_2 undergoes a change in the presence of water at elevated temperatures, resulting in greatly increased particle size, the water is replaced with alcohol before the autoclaving operation. The essentially desolvated SiO_2 is presumed to have a physical structure identical with that present in the original aquagel.

General Description of Process

Reference is made to the schematic flow diagram shown in Figure 1.

H_2SO_4 and $Na_2O \cdot SiO_2$ solutions of suitable dilutions are mixed in tank (1), the $Na_2O \cdot SiO_2$ being added to the H_2SO_4. Concentrations are controlled to yield a gel having 8 per cent SiO_2. After aging several hours to allow the gel to strengthen, due to syneresis phenomena, it is removed from (1) and passed through the roll crusher (2) into one of four wash tanks (3). Water is passed

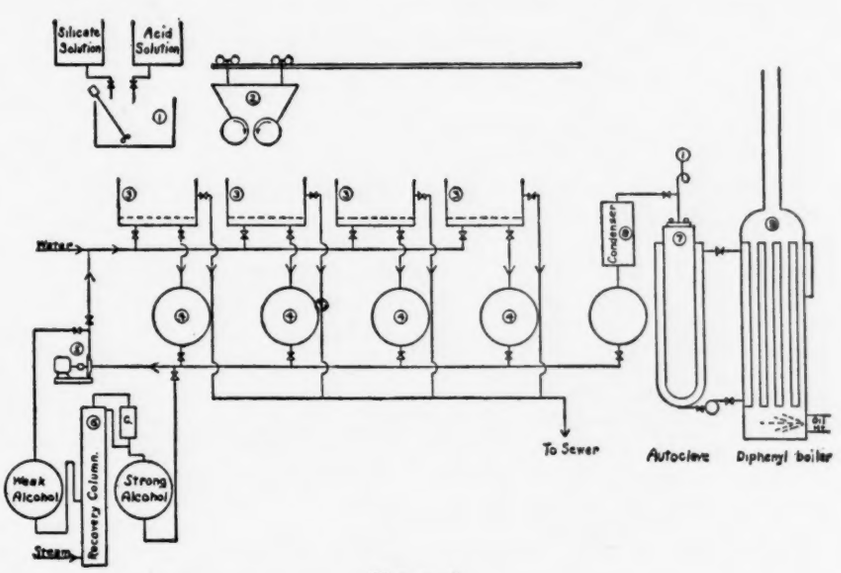


Figure 1

up through this tank over the gel to remove the Na_2SO_4 formed in the gel preparation reaction. When the gel has been sufficiently washed, all excess water is removed by draining and the gel is then covered with alcohol. After a suitable soaking time the alcohol is drained off and replaced with a fresh portion. The alcohol washing procedure is accomplished by the use of a conventional 4-stage counter-current system. Greater economy of alcohol is realized by using the cover, soak and drain method of washing in place of continuous flow through the tanks. The counter-current cycle is facilitated by use of the wash receivers (4) and the transfer pump (5). Weak alcohol taken from the system is recovered as strong alcohol by fractionation in a recovery column (6).

When the water in the gel has been substantially replaced with alcohol, the excess alcohol is drained off and the gel charged to the autoclave (7). Here it is heated to 550° F., the pressure being held to 1150 lbs. gage by bleeding off alcohol vapor through the condenser (8). When 550° F. is reached the pressure is reduced to atmospheric and the autoclave finally evacuated to 20 inches Hg. for 10 minutes. The resultant aerogel is then removed by an airveyor system. The autoclave is heated by a jacket containing diphenyl vapor at 80 lbs. gage pressure, this vapor being supplied by the oil fired diphenyl boiler (9).

Details of Autoclaving Operation

Conditions.—It has been found impractical to substitute alcohol completely for the water originally in place in the gel. Experiments showed that the above mentioned aging of the SiO_2 does not take place at a significant rate providing the liquid phase contains above 85% C_2H_5OH. Therefore the alcohol washing operation is designed to produce an alcogel having a liquid phase containing approximately 87 to 89% C_2H_5OH. The critical temperature of this system was established. The data secured are given in Table I and are plotted in Figure 2.

Table I.—The Critical Temperatures of Alcohol-Water Mixtures

% by Weight		*% Mole Fraction*		
H_2O	C_2H_5OH	H_2O	C_2H_5OH	T_c °C.
100	0	100	0	376
50	50	71.9	28.1	303
25	75	46.0	54.0	265
11.5	88.5	25.0	75.0	248
0	100	0	100	243

The critical pressure of the system has not been determined, but rather operation at 1150 lbs. gage has been selected as standard, this being found experimentally to be the lowest satisfactory pressure. Therefore, the conditions of the autoclaving operation are 250° C. at 1150 lbs. pressure.

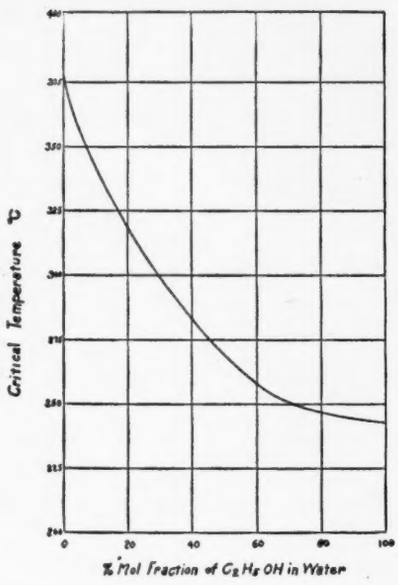


Figure 2

Apparatus.—Prior to the design of the pilot plant autoclave, our experience in autoclaving had been confined to the use of two pieces of apparatus. One of these, a laboratory autoclave, had a capacity of 200 cc. The weight of the autoclave metal was 60 times that of the charge. The smallness of the autoclave and the undesirable weight ratio prevented securing any design data. Several large batches of alcogel were made in an improvised washing system and autoclaved in a temporarily available apparatus and measuring 36 inches diameter by 36 inches high. This autoclave was heated by strip heaters placed against the outside surface. The required heating time per charge was 48 hours. As a result of this experiment an autoclave having a greater heating surface per unit of volume was designed for the pilot plant. The autoclave used in the pilot plant was 7.5 ft. high, had an internal diameter of 18 inches and a 4-inch charging hole at the top. A thermocouple well was attached to this cover and extended to within 6 inches of the bottom. During experimental runs, four thermocouples were placed in the well, their distances from the bottom being 78, 52, 26 and 7 inches.

The autoclave was heated by diphenyl vapor at 60 to 80 lbs. gage pressure in the jacket. This vapor was supplied by a vertical fire boiler, fired by a gun type domestic oil burner.

A condenser was provided for the alcohol gases issuing from the autoclave. Pressure in the autoclave was controlled by a throttling valve in this vapor line.

Method of Operation

Alcogel, with a liquid phase containing in excess of 85% C_2H_5OH, was drained free of any excess liquid, and charged to the autoclave in lump form, the particles averaging about ¼ inch in diameter. The cover was secured and diphenyl at 80 lbs. pressure was admitted to the jacket. When the pressure reached 1150 lbs., usually in 20 to 30 minutes, the throttling valve was opened and adjusted to maintain this pressure. Completion of the heating cycle was indicated when this valve could be closed tightly for a 5-minute period with no significant pressure rise. The valve was then opened and the pressure dropped to atmospheric, then the autoclave was evacuated to 10 inches of Hg. for 10 minutes. The vacuum was then released and the aerogel removed.

Data Secured.—During the operations several complete heat balances were made. The data taken and recorded were the following:

(1) Temperatures—four levels in the autoclave, diphenyl vapor to autoclave, alcohol vapor to condenser, alcohol condensate from condensers, inlet and outlet condenser water, room, and flue gas.

(2) Pressures—diphenyl vapor to autoclave and autoclave pressure.

(3) Other measurements — quantities: fuel oil fired alcohol condensate and cooling water. Analysis: flue gas and air humidity.

A blank run was first made on an empty system to establish the radiation and convection losses. Runs were also made using water in place of the alcogel for the purpose of establishing the diphenyl heat transfer coefficients. This was found to be in the order of 300 B.t.u./hr./ft.²/°F.

Results

The weight of alcogel charged per batch was 450 lbs. The average overall heat balance of several runs is given in Table II.

Table II—Overall Heat Balance

(B.t.u. above 70° F.)

Input:	
Fuel: heat of combustion	773,000
Water to condensers	—30,000
Air: sensible heat	1,000
	744,000
Output:	
Water from condensers	197,000
Losses: sensible heat of flue gas	237,000
Radiation	180,000
Heat into autoclave	121,000
Miscellaneous	24,000
Distribution of Heat in Fuel:	
Heat into autoclave	15.6%
Stack losses	31.0
Losses from boiler and autoclave	23.3
Useful heat	31.9
Lack of closure	1.9

Heat transfer coefficients were calculated for various time intervals of the runs. They were as shown in Table III.

Table III

Cycle*	Time of Cycle Minutes	Coefficient of Heat Transfer B.t.u. (hr.) (sq.ft.) (°F.)
1	24	—
2	7	38
3	7	46
4	6	38
5	6	30
6	8	28
7	8	46
8	6	27
9	10	16
10	12	18
11	13	4
Overall Coefficient		26

* Cycle: Oil burner on boiler was equipped with automatic shut-off at 80 lbs. pressure. Burner would not refire until stack had cooled down because of safety appliance. One cycle is time from the start of one firing until the start of the next.

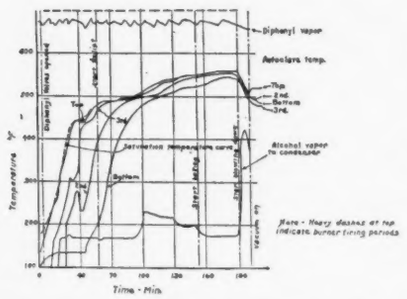


Figure 3. Temperature vs. time.

The temperatures recorded in an average run are graphed in Figure 3.

Discussion of Results

An analysis of the heat transfer data, particularly those given in Figure 3, permits an understanding of the method by which heat is transferred to the alcogel. The particles of alcogel adjacent to the heating walls become heated first, presumably by any or all three methods of transfer. The vapors created sweep upward and into the mass, heating the gel. The temperature rise of the gel causes an expansion of the liquid phase that is greater than that of the solid phase, so that the particles exude hot liquid. This flows downward into the cooler mass below and so aids heat transfer. That this gravity flow down into the interstices is important is shown by the fact that if the gel is charged to the autoclave and then the interstices filled with additional alcohol before the application of heat the overall heat transfer coefficient is reduced from 26 to about 15 B.t.u./(hr.)(sq. ft.)(°F.).

The surface of the boiling liquid is in the shape of a hyperboloid, the crown of which moves downward as the run progresses. A schematic representation of the isotherms is given in Figure 4. Direct confirmation of the existence of istherms of such shape was obtained by stopping the application of heat before the conclusion of a run. Careful removal of the contents disclosed a zone of unheated gel having a shape like that of the isotherm. The average rate of downward travel of

Figure 4. Shape of isotherms presumed to be existing in autoclave.

the isotherms has been calculated and is graphically presented in Figure 5.

The relation between height and rate of travel is a convenient expression but its limitations should be realized. The assumption made that the temperature has no effect is probably not correct, furthermore the data are valid only for the autoclave in question. Nevertheless, the relationship is useful for design purposes.

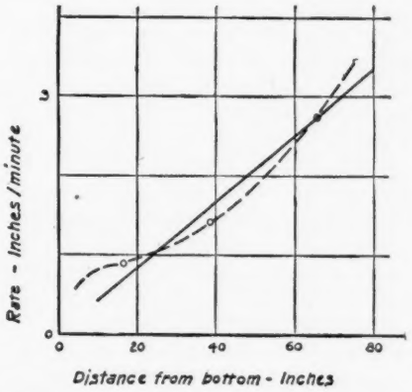


Figure 5. Average rate of downward travel of the isotherms.

Consideration was given to the possibility that a portion of the heat transferred was due to radiation. Calculation indicated that under the existing conditions as much as 35% of the heat might be transferred in this manner. It has been experimentally shown that fine silicon dispersed throughout the gel effectively opacifies the gel to radiant heat.[7] Silicon was dispersed in a gel by adding it to the mixture before gelation. In heating this gel in the autoclave the overall heat transfer coefficient was found to be, within experimental error, identical with that of an unopacified charge. The conclusion is that radiation plays a negligible part in the transfer.

It will be noted from the flow diagram that condensing diphenyl vapor at 80 lbs. gage pressure was used as a heating medium. The advantages of this system cannot be emphasized too strongly when heat must be transferred to high pressure vessels at high temperature levels. The use of direct fire increases the fire hazard when inflammable material is involved and creates the possibility of local overheating with an attendant explosion. The use of steam would involve excessive jacket pressures. The use of diphenyl does make adequate steam tracing of the system necessary since it freezes at 70° C. However, use can be made of this high freezing point, for when certain boiler repairs are necessary, the diphenyl can be easily frozen, thus avoiding the necessity of draining down the boiler. A boiler in operation for 2 years at 80 lbs. gage was recently examined and no more than a trace of carbon or high boilers could be found.

Summary

The method of preparing aerogels, with particular emphasis on the method of heat transfer when autoclaving a silica alcogel, has been described.

Overall heat balances and transfer coefficients have been given.

The advantages of diphenyl vapor as a heat transfer medium has been described.

Acknowledgment

The writer wishes to acknowledge the assistance accorded him by W. C. Dresser and W. S. Wilson of these laboratories, and by the School of Chemical Engineering Practice, Massachusetts Institute of Technology.

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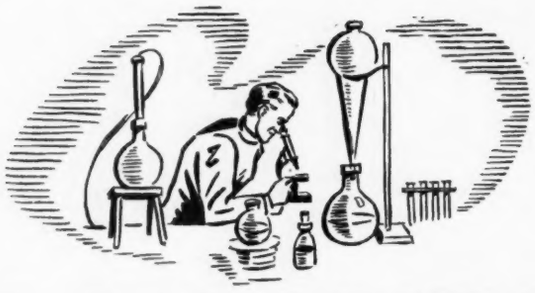
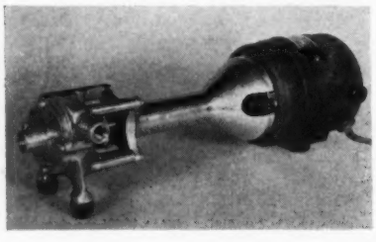


THE LABORATORY NOTEBOOK

Hot Liquid Pump

Eastern Engineering Co. has announced a newly designed and engineered "Midget Hot Liquid Pump." Its main features are compact size and construction, performance characteristics in relation to size, suitability for handling hot liquids up to 500°F.

The pump is a centrifugal type, 12" long x 4" wide by 4½" high and weighs seven lbs. It has a 1/20 H. P. Universal fan cooled motor for use on 115 volts, A. C. or D. C. Motor and pump are coupled through a 5" heat radiating tube. Shaft is supported by outboard ball bearings. Maximum operating pressure is 21 lbs. per sq. in. and maximum volume is 7½ gallons per minute.



The pumps are manufactured in stainless steel, monel metal, chromium plated bronze, Hastelloy "C" and other alloys. They can be used in industrial, pilot plant, laboratory, and experimental applications where thin liquids at temperatures up to 500°F. are to be handled.

Voltage Breakdown Tester

Simple and quick means of testing voltage breakdown of materials or components is offered by their Voltage Breakdown Tester according to Industrial Instruments, Inc. Housed in a sturdy metal cabinet with sloping panel, the instrument consists essentially of a step-up transformer accurately controlled by a variac; current-limiting resistors safeguarding the equipment in the event of a dead short; a relay indicating by means of a panel light when there is a breakdown; a meter providing direct-reading voltages; and the rectifier and filter circuit providing the high-voltage D. C. A self-incorporated safety switch makes the power supply inoperative if chassis is removed from case or otherwise disturbed.

The high voltage is applied by means of a suitable fixture or again by a test prod connecting with proper receptacle on the instrument panel, as well as by a second connection to the groundbinding post on the panel. The instrument connects with the usual 110-volt 60-cycle A. C. A ground clip goes on nearest grounded conduit or water pipe. A power switch turns the instrument on and off. To set the instrument for test, the variac is rotated counter-clockwise until desired voltage is indicated on the meter. When material or component is tested, a warning light on the panel flashes on to indicate breakdown. A second light indicates that the instrument is "alive".

INDUSTRY'S BOOKSHELF

Rationed Rubber and What to Do about It, by Williams Haynes and Ernst A. Hauser, Alfred A. Knopf, New York, 196 pages, $1.75. Reviewed by Edward V. Osberg, former editor, India Rubber World, now vice-president, Wilmington Chemical Corp.

The authors of Rationed Rubber, one with a notable background in the chemical publishing field and the other an eminent figure in the realm of high polymer chemistry, explain what is perhaps one of the most serious and complex problems now confronting America, a nation rapidly being geared to modern mechanized warfare, but lacking in one of the most vital commodities necessary to such a program. Here, in the space of less than 200 pages, are presented, in clear and forceful terms, the facts on our present rubber situation, interwoven with a historical background that throws our present predicament into sharp relief.

In contrast to many previous attempts to explain this confusing subject, the picture painted is neither comforting, nor is it hopeless. The authors are realistic; they point to the stupendous task of building synthetic rubber plants, to the difficult job of properly utilizing these substitute rubbers so that we might keep the armed might of this nation and our allies rolling. We are told of the shortcomings of synthetic rubber, emphasized by Germany's experience, which indicate the present necessity for a supply of natural rubber to use with synthetics in producing serviceable tires. Little hope is held for obtaining significant quantities of natural rubber from South America, Africa, and Ceylon, and our expectations from guayule or "home-grown" rubber are projected into future years. The authors warn, in no uncertain language, that **all** of our rubber must go to our war effort, that the public can expect no relief in the form of new tires before 1945 at the earliest, and that the American motorist, the custodian of the nation's largest stockpile of rubber, must conserve his tires. How the consumer may get the most out of his rubber goods is told in the final chapter. The facts in general are accurately presented. One unfortunate error occurs in respect to the yield of guayule which is given as 1800 short tons per acre, where undoubtedly 1800 pounds is the intended figure.

While designed to properly acquaint the American public with our rubber problem, Rationed Rubber does something more. It affords the rubber manufacturer, the government bureaucrat, and the technologist, who have been struggling with a maze of conflicting and confusing data and opinions, an opportunity to re-orient their thoughts and to re-evaluate their ideas. Besides, the book contains data of recent origin which may play an important part in the technological development of our rubber future. The role of isoprene in the low temperature application of synthetic rubber is discussed, as is the reclamation of the various types of synthetic rubber, until now a perplexing problem.

By writing this book the authors have performed a real service, but the fulfillment of this service to the nation will come only when the book has been read by the American public, both layman and technologist.

NEW PRODUCTS AND PROCESSES

By James M. Crowe

THE Ford Motor Company has recently released information on a new process for producing iron from low-grade ores. Experiments which have been pushed steadily for a dozen years have found a way to recover iron from vast deposits of unwanted. low-grade ore. But even more significant, the iron obtained by the Ford method has some unusual characteristics that make it useful in the new field of powder metallurgy.

Unlike iron recovered by smelting it is said to be more ductile, resists corrosion, and has magnetic properties that improve motor car performance.

Huge deposits of poor ore, much of it in Michigan's upper peninsula, were the original object of the Ford experiments. Smelting was ruled out as a method of iron recovery because of excessive cost. Research men tried a number of recovery methods and finally settled on electrolysis. The theory is not new, but the company believes an electrolytic method which would be feasible commercially has been perfected for special purposes.

"We're beyond the experimental stage now," Henry Ford said in talking of the process. "We're preparing to build a pilot plant at the Rouge, where apparatus developed in our experiments will be reconstructed on a larger scale. This will be an intermediate step on the way to full-scale operations, but iron produced in the pilot plant will be used in our manufacturing."

The method of recovering iron from low-grade ore is really a system of electroplating, and for work on an industrial basis, cheap electric power is essential. The system works this way: Iron is dissolved out of the ore in chemical solution, then is plated out of the solution by electrolysis. One electrode is coated with iron 99 per cent or more pure, which can be removed in sheet form. Since the sheet contains a slight amount of hydrogen, it is easily pulverized for use in powder metallurgy. On the other hand, if the sheet is heated slightly, the hydrogen is driven off and the iron becomes ductile.

New avenues in industry seem certain to be opened by this method. The iron powder can be molded into high-precision gears in a single press operation, producing a gear that needs no machining. Metallurgists explain that molecular cohesion of the iron powder through fusion gives strength to gears or other machine parts made in this way.

The advantages of electrolytic iron are not limited to manufacturing, Mr. Ford said. Motor car performance may also be improved by using it. For example, cores of distributor coils now in general use sometimes tend to lose their high-spark efficiency at high speeds because the core remains partly magnetized between spark impulses, he explained. The electrolytic iron cores produced in the Ford laboratory have shown high-spark output at all speeds because this type of iron does not retain magnetism between electric impulses.

Emulsifying Agent

Pfaltz & Bauer, Inc. are currently calling the attention of the trade to their product "Mulag" which is used as an emulsifying agent in making emulsions of hydro-carbons of various groups of the aliphatic and aromatic series, emulsions of various chemicals and terpenes. It is also used in the manufacture of acoustic plaster containing calcimined gypsum and other substances, as well as for tar emulsions. "Mulag" also finds use in the manufacture of dispersed coating compositions for use on concrete, brick and stucco. It is used in impregnating compositions for treating builders felt, tar paper and similar materials. It is used as a dispersing agent for making emulsified germicides and deodorizing preparations, boring oil emulsions, drilling oils, grease and lubricating compositions containing various animal fats in emulsified form.

High-Impact Plastic

A new high-impact plastic of the phenolic type was recently announced by Durez Plastics & Chemicals, Inc. Increasing demands for heavier duty molding compounds to replace other vital materials in war production are said to be the reason for the development of Durez 11934, as this new material is to be known. It has a macerated fabric filler and consequently is not readily preformed. It has an impact strength of 2.0 and a specific gravity of 1.44. It is said to have a very good cure cycle for a material of this type and is available in black or brown color. Durez 11934, it is stated, will meet the special impact requirements that are required for such applications as small pulley wheels, casters, rollers, etc.

Rubber-Reclaiming Process

United States Rubber Company has developed a method of reclaiming used rubber which it says improves the quality of the reclaim, saves materials, and reduces the processing time so drastically that it increases the capacity of certain existing equipment by sixty per cent.

By this method the processing cycle is reduced from 16 to 9½ hours. And at the same time the quality of the finished reclaim is improved because of a change and a reduction in the chemicals used in the process, according to W. G. Kirby, manager of reclaim development of Naugatuck Chemical Division, which operates the reclaim plant for the rubber company.

"If present plans for scrap rubber collection are successful and used rubber is made available in large quantities, this new process along with other developments of this kind may be of value in increasing the present reclaim capacities without the building of additional plant facilities.

"In reclaiming used rubber it is necessary to remove or dissolve any fabrics which the used rubber may contain. Also the scrap is treated to soften or plasticize the rubber and convert it to a physical state similar to unvulcanized rubber.

"According to former processes, a 'digester' was charged with scrap rubber, caustic soda, pine tar oils and water", stated Mr. Kirby. "The mass was heated by steam under pressure and agitated for sixteen or more hours.

"With the new method, air is introduced into the chamber with the scrap, the steam pressure is increased to raise the temperature, the amount of pine tar oils is reduced, and the mixture is agitated for a much shorter time.

"The result is an improved quality of reclaim with a reduction of processing time and a saving in materials."

New Extender Replaces 5 to 20% of Rubber in All Types of Compounds

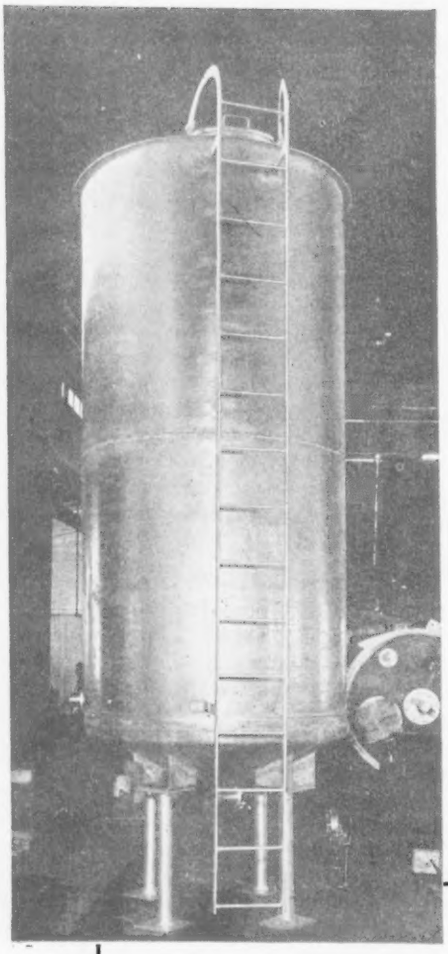
Existing supplies of rubber can be extended through the use of "Extendex C", a new material offered by Wishnick-Tumpeer, Inc. It can be used to replace from 5 to 20% of the rubber hydrocarbon in all types of compounds without sacrifice of physical properties, according to the supplier.

Described as a sponge-like material prepared by special patented processes from carefully selected vegetable oils, "Extendex C" is said to be radically different from vulcanized oils in its effects on the properties of rubber. An interesting feature is that it enters into the vulcanizing reaction, and requires the same amounts of sulfur, accelerator, and zinc oxide as does the rubber hydrocarbon. Hence, no change is needed in the quantities of these ingredients when "Extendex C" is used in existing formulations.

The new product is insoluble in water and in common organic solvents, and can be used in compounds requiring chemical resistance. In addition to serving as an extender, it also acts as a plasticizer, permitting easier processing of uncured stock on mill, tuber, or calender. It serves also as a dispersing agent for carbon black in heavily loaded compounds. Of particular interest is the claim that it may be used in place of rubber in tires without loss of resistance to abrasion or wear.

Designed for a War Industry

BY PATTERSON-KELLEY



66" in diameter and 152" high, this Patterson-Kelley Vertical Storage Tank is constructed of 1/2" aluminum plate. It contains 66' of 1 1/2" aluminum I.P.S. tubing. Fill chute measures 14" x 20". The ladder is of steel.

This aluminum stearic acid remelt tank is a product of Patterson-Kelley's years of practical experience in engineering durable, efficient industrial equipment. From blue print to installation of the completed tank, Patterson-Kelley engineers and designers, mechanics and inspectors make it their business to see that the finished product meets performance specifications to the letter.

That's the kind of teamwork that has become familiar practice in Patterson-Kelley's East Stroudsburg plant. Through the years, it has resulted in re-orders of Patterson-Kelley autoclaves, kettles, cookers, separators, stills, tanks and heat exchange equipment from many of America's largest industries. These units may be fabricated in a variety of metals and alloys to meet the most exacting requirements of your operating conditions.

Patterson-Kelley's enviable reputation for dependability and quality workmanship invites *your* confidence. If you have an equipment problem, why not consult our engineers—at no cost to you? Write today for your free copy of the Patterson-Kelley Chemical and Process Equipment Catalog.

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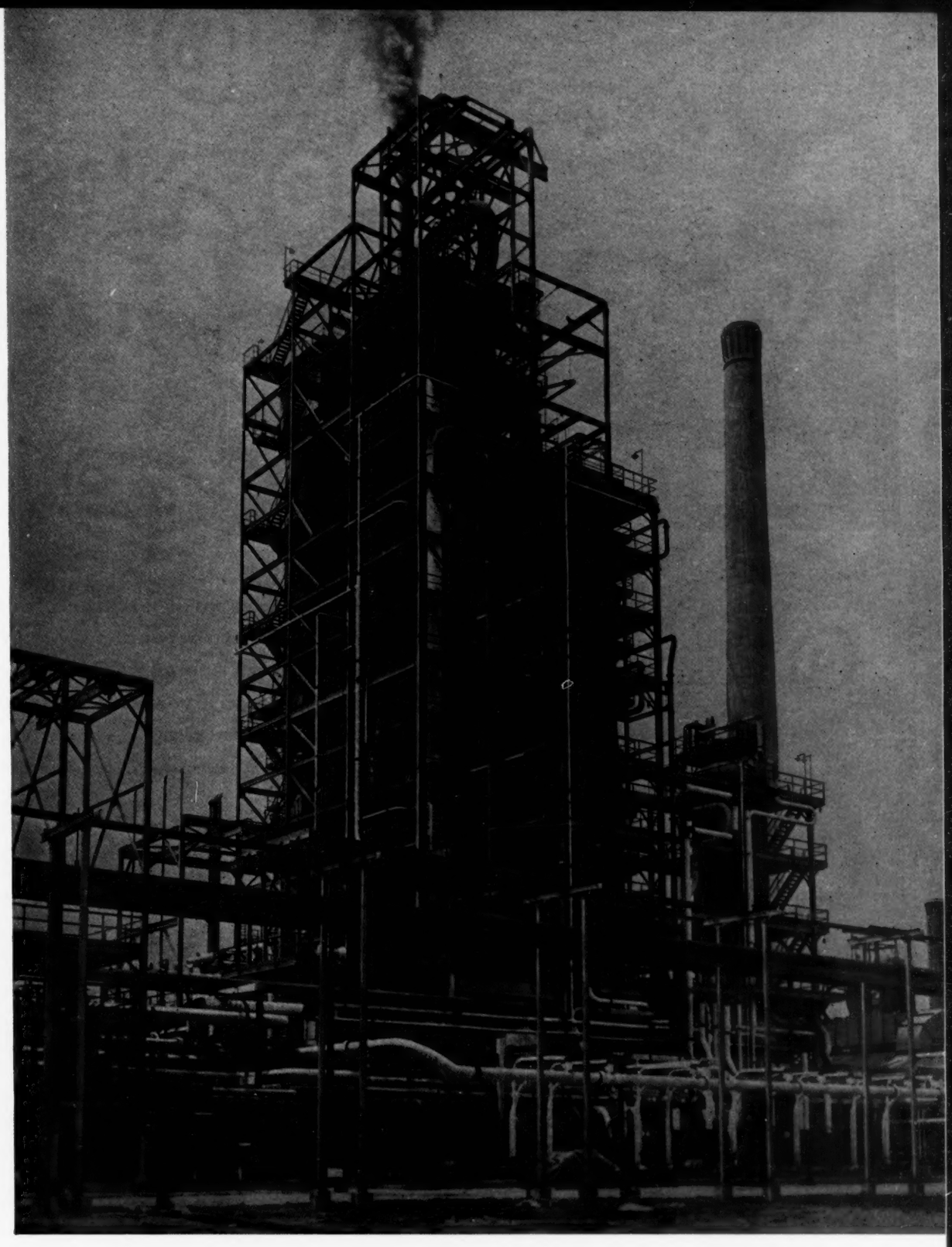
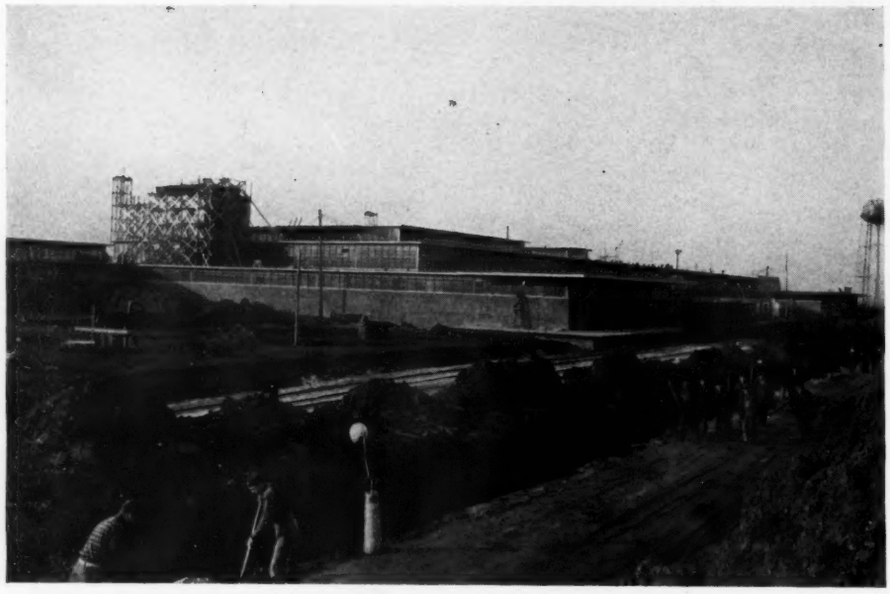


FIRST NEW "CAT" CRACKER. This imposing unit has just been placed in operation by Standard Oil Company of N. J. It will make both 100-octane gasoline and raw materials for synthetic rubber. Thirty similar units are now under construction throughout the country. They are commonly known as fluid catalytic cracking units, or "cat" crackers.

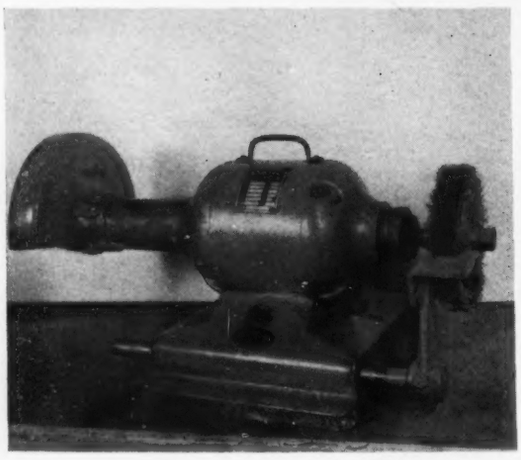
PLANT OPERATION AND MANAGEMENT

Digest of New Methods and Equipment for Chemical Makers



Magnesium Oxychloride Sparkproof Floors

By Max Y. Seaton
Westvaco Chlorine Products Corp.



Now a more cogent problem than ever, sparkproof floors that will stand the punishment of factory traffic have come into great demand. This story of Westvaco's development program gives you a complete picture of progress that has been made. Tentative specifications for sparkproof plastic composition flooring are included.

Top illustration shows construction of an Iowa ordnance plant which is being constructed with magnesium oxy-chloride sparkproof floors. Machine below is the apparatus for attrition spark tests described on this page. See other photos.

IN 1921 a leaky valve and a carelessly-struck spark touched off a disastrous explosion in a plant manufacturing inflammable gases. From that catastrophe came the demand for a sparkproof floor that would also withstand the punishment of factory traffic.

For many years the Newark California plant of Westvaco Chlorine Products Corporation had been producing Caustic Calcined Magnesite which can be used as a binding agent for inert fillers to produce a plastically laid sparkproof magnesium oxy-chloride cement floor. A development program was undertaken to devise an industrial floor which in addition to being sparkproof would additionally be resilient to reduce worker fatigue, have a surface resistant to the abrasion of factory trucks and also be water resistant. Tests revealed that this combination of properties could be obtained with the two-layer floor. Accordingly a combination was worked in which the undercoat contains highly resilient fillers while the top or wearing coat includes harder fillers, none of which would produce sparks from striking or abrasive action.

After thorough testing, these floors were installed in numerous manufacturing plants and distributing stations for inflammable gases. To date no instance has been reported of fire or explosion having occurred, attributed to a spark in any of these installations.

From time to time explosions have occurred in plants manufacturing and loading war munitions and investigation has indicated that several of these might have been caused by a spark from a metal object striking a concrete floor or from sparks due to the build-up of static electricity on the persons of the workmen during cold, dry weather.

In 1940 when the original expansion program for munitions manufacture started, Government engineers and private explosives manufacturers conducted lengthy studies. To meet their specifications, the flooring would have to pass rigid physical and sparkproof tests. During the investigation, samples of magnesium oxy-chloride floors were submitted for test by several manufacturers of this type of flooring, as a result of which over two million square feet of this type of flooring were specified and installed in various projects such as powder plants, bag loading plants, shell loading plants, etc. One of the leading flooring manufacturers developed standard testing practices, briefly described below:

Tests for Attrition Sparks.

This test is made in a dark room by striking the sample with iron. The apparatus used is a high speed grinding wheel adapted to this purpose and having two types of striking mechanisms, i.e., a small iron chain and a stiff iron wire wheel. A sparkproof flooring should not show any sparks when tested by either of these mechanisms with the wheel rotating at not less than 1000 r. p. m.

Tests for Static Sparkproofness.

The field test used for this determination is to measure the resistance of the flooring between any point and the ground. Pointed test prods are used, which are tightly pressed against the floor by a force of approximately 100 pounds. The resistance thus measured should not exceed one megohm. With this resistance, the maximum voltage that could be set up by the best electrostatic machine, would be 40 volts, whereas, the minimum voltage that will cause a spark in air is 330 volts.

The conductivity figures given above may arouse some discussion, so that it might be well to mention that a more complete description and theoretical basis is contained in the complete procedure.

Ability to prevent the build-up of static electricity has been achieved by a grid fastened to the upper surface of the undercoat, and thus thoroughly imbedded into the top coat composed of right angled brass strips on 3 ft. to 10 ft. centers, welding or soldering the joints and joining the ends with suitable ground connections. In other instances copper wire mesh has been imbedded in the top coat.

Since 1940 the published literature of the medical profession has frequently referred to explosions in hospital operating theatres due to ignition by sparks of various anesthetic gases. In addition to laying sparkproof floors of the same type as in munitions plants, most hospitals are endeavoring to adequately ground all metallic equipment used in such rooms and prohibit the wearing of silk clothing by surgeons or nurses. In some cases rubber soled shoes are not permitted unless some effective means is employed to annul electrostatic action. This has been done by a metal plate between the bottom layers of the leather sole or by a small drag chain attached to each shoe.

Specifications of various architects have differed somewhat as to the physical properties and the tests for sparkproofness required of the floors. The best features of all, plus experience to date in 15 plants, have enabled us to correlate the information and prepare a standard specification and testing practice for sparkproof floors which will meet all requirements. These suggested specifications covering the important points to be covered in the materials, installation and test of sparkproof floors are given at the end of this article.

While there are many manufacturers and contractors capable of installing ordinary industrial magnesium oxy-chloride floors, there are some bidders on sparkproof floor installations whose particular flooring does not meet all necessary sparkproof qualifications and frequently such contractors have not had the necessary background and experience to insure the best results. In order that the architect and general contractor may judge the qualifications of bidders, we have prepared a questionnaire which should accompany each request for bid and all bidders should be expected to satisfactorily answer this inquiry before their bid is accepted for serious consideration.

TENTATIVE SPECIFICATIONS FOR SPARKPROOF PLASTIC COMPOSITION FLOORING.

PREAMBLE:

1. Contractor shall furnish all materials, labor, tools, appliances, insurance, etc., required to perform all work covered by these specifications, with skill and efficiency and at a speed to meet the satisfaction of the engineers in charge.

2. Should this contractor fail to perform to the satisfaction of the engineers, they may, at their discretion and in the best interest of the project, perform any uncompleted work themselves and deduct for this work at the full unit price specified.

3. The contractor shall be responsible for all flooring specified herein and shall give evidence that he can provide skilled and trained engineers, chemists, timekeepers, etc., if and as required to properly and efficiently handle this entire project.

4. The contractor shall have been established for more than ten years and have a skilled crew of men in his present employ, capable to perform or direct all of the types of work involved herein. The

Project	Location	Area Installed in Square Feet	Plant Owners Or Operators
Ordnance Plant	Colorado	270,000	Remington Arms Co.
Ordnance Plant	Utah	120,000	Remington Arms Co.
Coosa River Ordnance Plant	Alabama	180,000	Coca-Cola Company
Indiana Ordnance Works	Indiana	170,000	E. I. du Pont de Nemours
Hoosier Ordnance Works	Indiana	150,000	Goodyear Rubber Co.
Lake City Ordnance Plant	Missouri	170,000	Remington Arms Co.
Ordnance Plant	Missouri	245,000	Western Cartridge Co.
Alabama Ordnance Plant	Alabama	45,000	E. I. du Pont de Nemours
Twin Cities Ordnance Plant	Minnesota	300,000	Federal Cartridge Co.
Ordnance Plant	Iowa	300,000	U. S. Rubber Co.
Mississippi Ordnance Plant	Mississippi	80,000	General Tire Mfg. Co.
Naval Fuse Loading Plant	Georgia	50,000	Reynolds Corp.
Naval Torpedo Station	Rhode Island	10,000	U. S. Navy
		2,070,000	

Right, test for conductivity. Sample piece of flooring is given a spark gap test between the two electrodes.

Below, a good example of the type and expanse of plants being equipped with sparkproof floors. This is an ordnance plant, finished since this photo was taken.

essence of this contract shall be speed and ability to produce a workmanlike installation of all materials concerned and this factor shall bear weight in awarding this contract.

5. All foundations shall be prepared for this contractor in accordance with these specifications. The concrete slab shall be cured for at least 30 days before the plastic composition is applied. It shall be dry and remain dry. The top surface of the concrete slab shall be screeded to a level surface ¾" below finish floor elevation. Concrete shall not be trowelled but shall be left rough similar to a road finish by going over the surface with a coarse street broom. The contractor shall inspect these foundations and approve them for his work during construction and immediately prior to his installation. Any necessary corrections shall be made by others. Foundations shall contain no calcium chloride, lime or other antifreeze, waterproofing or accelerating chemicals.

6. With each bid there shall be furnished samples of each type of finished floor and any other materials herein specified. These samples shall be tested and compared by the engineers in charge, and the award of the contract shall be contingent upon their approval of these samples.

GENERAL REQUIREMENTS:

Floor shall be non-sparking with metal objects, as demonstrated by striking with a motor driven flail or an iron wire brush of not less than 6" diameter, rotated at not less than 1000 r. p. m. in a perfectly dark room.

Floor shall be sufficiently conducting to prevent building up of sparkable potentials. In this respect it must be capable of preventing a build-up of sufficient voltage on a .002 mfd. condenser, using a 200-volt source, to discharge a sensitive neon lamp having a discharge potential of less than 100 volts.

This flooring shall be a heavy duty, sparkproof plastic composition, using magnesite as a binder in a mix compounded to produce optimum resilience and strength. It shall contain not less than 15% of fibrous ingredient and not less than 45% of Plastic Magnesia, meeting specifications outlined below.

(Above figures are not intended to control proportioning of mix, but are minimums only. The formulation used must conform to physical characteristics outlined below.)

This flooring shall be installed to a minimum total thickness of ¾" using at least a ⅜" base coat and a ⅜" sparkproof top coat. Any aggregate used in this flooring shall be such that it will not spark when tested by the rotating wire wheel or flail test described above.

The flooring covered by these specifications shall be entirely factory compounded in a plant capable of producing a uniformly mixed product and at the speed required. All mixed materials shall be shipped to the job in moisture-proof lined burlap containers marked with a lot number to identify them with the tests on both raw materials and finished product.

INSTALLATION PROCEDURE:

Concrete shall be thoroughly dry for the installation of this sparkproof composition flooring. The concrete shall be primed to provide the best possible bond strength.

The gauging of the dry flooring shall be done by skilled labor and the solutions used shall have the proper density to give optimum strength and the proper concentration of sulfate to react with any free lime present in the Plastic Magnesia.

In all areas where this flooring is installed, the temperature shall be maintained at approximately 70° F. and such heat shall be provided by others.

STATIC GROUNDING:

This flooring shall include the installation of brass angle bars extending through the entire thickness of the top coat and fastened to the base coat. These strips shall be made of not less than 20 gauge brass and shall be spaced on not less than 3 foot centers and not more than 12 foot centers, as required by the size of the areas involved.

These strips shall be soldered by means of a 12 gauge copper connector at each joint and shall be permanently connected to grounding bus bars at not less than two points.

All electrical work in this connection shall be performed by others.

GUARANTEE:

This contractor shall guarantee these floors for a period of one year against any defects arising out of defective workmanship or material.

LABORATORY TEST REPORTS:

This contractor, when requested, shall furnish certified copies of the following laboratory reports:

1. Tests on each lot of Plastic Magnesia used. Such samples shall be taken as representative of each carload of Plastic Magnesia received.
2. Tests on each lot of the completed Sparkproof mix. (A given lot shall be made up from one shipment of raw materials. When a new shipment of any raw material is used, a new test shall be made.)

The following physical tests shall be made and exceed the Minimum Requirements shown:

	Minimum Requirements
1. On the Plastic Magnesia	
a. Fineness	Greater than 90% washed through a 200 mesh screen.
b. Setting time	Initial—not less than 2 hours 45 minutes. Final—not less than 3 hours 45 minutes.
c. Tensile strength	At 28 days—not less than 600 lbs. per sq. in.
d. Modulus of rupture	At 28 days—not less than 1400 lbs. per sq. in.
e. Linear change	For 28 days—maximum .070% of length.
2. On the Sparkproof Mix	
a. Setting time	Initial—not less than 3 hours 20 minutes. Final—not less than 4 hours 30 minutes.
b. Tensile strength	At 28 days—not less than 735 lbs. per sq. in.
c. Modulus of rupture	At 28 days—not less than 1600 lbs. per sq. in.
d. Compressive strength	At 28 days—not less than 5500 lbs. per sq. in.

CHEMICAL TESTS ON PLASTIC MAGNESIA (before use):

a. Ignition loss
b. Silica determination
c. Total lime
d. Total magnesia content (MgO)

PHYSICAL TESTS ON PLASTIC MAGNESIA (at least 14 day tests to be complete before use.)

1–a. Composition of dry mixture
1 part by weight of Plastic Magnesia
2 parts by weight of silica, 150 mesh
5 parts by weight of Ottawa testing sand, 20-30 mesh

b. Gauging solution and consistency
The gauging solution shall be 22° Baume magnesium
Chloride plus magnesium sulfate if required to compensate for high free lime.

c. Mixing
The three ingredients shall be thoroughly mixed before gauging and shall then be mixed with 175 ml. gauging solution per 1000 gms. dry mix and worked to a uniform consistency by hand using rubber gloves.

d. Standard storage conditions
All test pieces during the entire time of testing shall be stored in a cabinet with free circulation of air at a temperature of 70° F. and a relative humidity of 50%.

2–a. Determination of fineness
A standard, 200-mesh sieve conforming to the specifications of the U. S. Bureau of Standards is used for this determination. A stream of water is used to wash the material through with a 100 gm. sample.

b. Determination of setting time
The setting time measurement shall be made on a pat of the standard mix having normal consistency. This pat, which is one-half inch thick and about three inches wide and six inches long, shall be made and stored under standard conditions. The magnesia shall be considered to have an initial set when the pat will bear, without appreciable indentation, a Gilmore needle one-twelfth inch in diameter loaded to weigh one-quarter pound. Final set is reached when the pat will bear, without appreciable indentation, a Gilmore needle one-twenty-fourth

inch in diameter loaded to weigh one pound. In making the test, the needle shall be held in a vertical position and applied lightly to the surface of the pat. Any suitable automatic setting time machine may be used in carrying out these tests. The time of setting should be taken from the start of mixing the ingredients.

c. Determination of tensile strength

For the determination of tensile strength, standard briquettes of the dimensions adopted for test pieces used in testing cement mortars (A.S.T.M. Standards 1933, p. 20) shall be used.

Immediately after mixing, the standard cement mixture shall be placed in moulds, and shall be shaken thoroughly with a small putty knife or spatula to remove air bubbles, and shall be smoothed off with a spatula. Additional cement mixture shall be heaped above the mould and the spatula drawn across in such a manner as to exert a moderate pressure on the material. Previous to filling, the moulds are painted with a solution of stearic acid in carbon tetrachloride to facilitate removing. The briquettes shall remain in the moulds in the controlled atmosphere for eighteen to twenty-four hours, after which the mould is broken and the briquettes stored on edge so that ample air circulation is provided on all sides. Tensile strength determinations are made on three briquettes at 3, 7, 14 and 28 days.

Tests shall be made with any standard machine used for Portland cement briquettes. The bearing surfaces of the clips and briquettes shall be free from grains of sand or dirt. The briquettes shall be carefully centered and the load applied continuously at a rate of 600 pounds plus or minus 25 pounds per minute.

d. Modulus of rupture

For this determination, at least four standard bars ½" x 2" x 22" shall be used. Bars shall be mixed, placed and stored the same as described under tensile strength.

Tests shall be made with a machine designed along the same general lines as that used for testing concrete (A.S.T.M. 1930 Vol. 30 p. 1030). This machine shall be so constructed that the force applied to the bar will be vertical and uniformly distributed across the center of the bar. The end supports of the bar shall be adjustable to 10" and 20" in order to allow bars with exactly 10" and 20" span lengths to be broken. Force shall be applied to the bar by dropping lead shot into a pan attached to the center load-applying block. The machine is so designed that when the bar breaks, the shot is automatically shut off by means of a lever arm which is struck by the pan as it drops.

The bar to be broken shall be carefully centered on the end supports and the load-applying block brought in contact with the upper surface of the bar. The smooth side of the bar should be up. The load may be applied rapidly up to approximately 50 per cent of the breaking load, after which it is applied at a rate of 10 pounds or less per minute. Each bar tested shall be broken three times—one 20" span and two 10" spans. The cross bending modulus or modulus of rupture is calculated for each break, the average being taken to represent the strength of the bar. Any bar which is obviously defective shall not be used for the determination of cross bending strength, nor shall any break, made on the same bar, which gives a modulus differing by more than 25 per cent from the average of the three breaks be considered in the determination of modulus of rupture. The thickness of the bar shall be measured to the nearest 1/100 of an inch.

The cross bending modulus or modulus of rupture is calculated from the length of the span, the weight required for rupture and the width and thickness of the bar by means of the following formula:

$$M_r = \frac{3\ WL}{2\ BD^2}$$

Where

M_r — Modulus of rupture in lbs./ sq. in.
W — Load applied in lbs.
L. — Length of bar in inches between end supports
B. — Width of bar in inches
D. — Thickness of bar in inches

For a ½" x 2" bar supported on centers as shown, formula may be simplified as follows:

20" — M_r equals 60 W
10" — M_r equals 30 W

e. Determination of linear change

In this method, the measurement is made to 0.001% of length. It is, therefore, necessary for all bars and measuring equipment to be kept at a constant temperature. The bars for this determination are made up at the same time as those for cross bending strength. Linear change measurements by all methods shall be made at 1, 3, 7, 14 and 28 day age.

The measurements of linear change in this method are made on bars 1" square by 10" long. These bars are formed in collapsible brass moulds 1" x 1" x 10" and have glass inserts firmly cemented to each end. After the moulds have been greased or painted with a carbon tetrachloride solution of stearic acid, the glass inserts are placed in the end of the mould with a ground glass side toward the center (i.e., their smooth surfaces against the ends of the mould), the standard cement mixture poured in and struck off level with the top. When the cement reaches final set, as determined by the Gilmore needle, the mould shall be carefully broken and the initial or reference measurement made immediately. After taking this initial measurement, the bar is placed upon a smooth non-absorbent support that will allow the air to reach all four sides of the oblong. Additional measurements are made at the specified times.

The equipment for making the measurement consists essentially of a cradle which holds the oblong in position so that one end bears against a tail piece and the other end is presented to a micrometer which reads to .001". The oblongs are placed in position so that one end rests snugly against the tail piece while the micrometer, with a ratchet click, bears against the opposite end and the reading taken. The difference between the reading in inches at final set and that at any age multiplied at ten is the percent change in length.

PHYSICAL TESTS ON SPARK-PROOF MIX:

1–a. A representative sample of each lot of the mixed cement shall be gauged with the same solution and be approximately the same consistency as used for the actual installation.

2–a. Determination of setting time

Same as setting time on Plastic Magnesia

b. Tensile strength

Same as tensile strength on Plastic Magnesia

c. Modulus of rupture

Same as modulus of rupture on Plastic Magnesia

d. Compressive strength

For the determination of compressive strength, standard A.S.T.M. moulds 2" x 2" x 2" shall be used. Moulds shall be filled and stored as described under tensile strength.

Tests shall be made with a standard hydraulic press of at least 30 ton capacity and equipped with an accurate hydraulic pressure gauge, approximately 15" in diameter, and having a "top reading" hand.

This press shall be equipped with a ball and socket anvil having a ball at least 3" in diameter. The cubes shall preferably be capped to provide true ends.

97% CONVERTED TO WAR WORK!

OFFICIAL U.S. NAVY PHOTOGRAPH

THERE'S no better evidence of how completely America is turning into one vast arsenal than the case of the Jaegle Paint & Varnish Co. of Philadelphia.

Offhand, you might expect that a considerable proportion of their output of Industrial Finishes would be devoted to Army and Navy requirements. But would you ever suspect that 97% of this company's production is now being used to paint battleships, destroyers, aircraft hangers and other military and naval buildings?

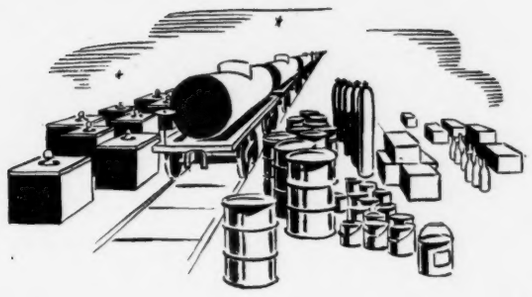
And as Jaegle Industrial Finishes are shipped in sturdy Crown Pails . . . this is one more case where Crown containers are helping in the all-out war effort. The 5-gallon Crown Pails used by Jaegle are easy to handle despite their weight when full . . . for there's a smoothly turned wooden handle on the securely attached bail.

CROWN CAN COMPANY, PHILADELPHIA, PA.

Division of Crown Cork and Seal Company

★ ★ ★ ★ ★ ★ ★ ★ ★

CROWN CAN



PACKAGING & CONTAINER FORUM

By Richard W. Lahey

Restrict Container Materials

CHEMICALS Branch of the W. P. B. will require that any chemical plant which operates under Order P—89 Amended shall send the following information to the Chemicals Branch of the W. P. B. and shall obtain approval before ordering packaging materials under the A-1-C rating authorized in this order.

Because of the increasingly critical situation with respect to steel and metal containers of all kinds, it has been found necessary to require this information.

1. The quantity to be ordered.
2. Complete specification as to gauge, size and capacity.
3. Inventory position with respect to such packaging materials.
4. The material to be packed in such drums or in containers to be made with metal to be ordered for fabricating of such.
5. The reasons why substitution for metal containers can not be made.

At the same time attention is called to alternative packaging materials such as paper, fiber, glass, plywood, slack wood cooperage, tight wood cooperage.

Authority for this is in paragraph (d) (5) of Order P—89 as Amended and reads as follows:

"The Producer shall not apply any preference rating hereunder to obtain scarce material, the use of which can be eliminated without serious loss of efficiency by the substitution of less scarce material or by simplification of design."

I.C.C. Regulations Changed

On June 6th, 1942, the I.C.C. published several applications for amendment to the regulations. Any party who desired to be heard on these proposals was to communicate with the Commission in writing by June 26th last. The proposed changes of interest are as follows:

(1) *Sec. 61 (f) (1) and Sec. 61 (f) (3) (a) Pentolite* has been added to the group of high explosives with no liquid explosive ingredient nor any chlorate.

(2) *Sec. 110 (a) (4) and Sec. 110 (a) (18)* the *I.C.C. 17E drums authorized* for carload and truckload shipments of *inflammable liquids, flashing below 20°F.* has been extended to less carload and less truckload shipments.

(3) *Sec. 113 (f)*—Covers exemptions for small shipments of paints, enamel, lacquers, etc. Shipments in inside containers, glass of not over 1 quart capacity each and metal of not over 5 gallons capacity each, are included in this exemption. Truck and freight shipments will be completely exempt from all regulations, water shipments will be exempt except name of contents must be shown on shipping container and I.C.C. labels are required, and express shipments will be exempt except I.C.C. label is required as prescribed in Sec. 404(e). When the fiberboard box is used for any shipment, gross weight must not exceed 65 pounds.

(4) *Sec. 184(a) Nitrocellulose colloided, granular, or flake wet* have been added to this section of the Regulations.

(5) *Sec. 264(o)(2)* Add to the list of approved cylinders for transportation of *anhydrous hydrofluoric acid* seamless cylinders I.C.C. 3E if not brazed.

(6) *Sec. 272(f)* The I.C.C. 103A *tank cars* authorized for *sulfuric acid* shipments will be limited to acid of 1.5591 specific gravity (52°Be) or greater strength.

(7) *Sec. 346(b)* To the list of authorized *cylinders* containing *methyl bromide,* I.C.C. 3E—1800 seamless cylinders have been added. All of the other provisions of this section are unchanged.

(8) *Sec. 357(a)(12)* The I.C.C. *21A fiber* is added to the list of *cyanide containers.* The maximum loaded capacity is set at 225 lbs. net. The 21A drum is to contain one added ply of asphalt laminated kraft 30/60/30 basis weigh in side walls and heading (metal heading excluded). This drum must also withstand 2 drops from a height of 4 ft. or one 6 ft. drop in place of the drop test as provided in the 21A specification.

(9) *Sec. 361(9) Note. Tape* used for covering seams of *fiber board boxes* holding Class B. *poisonous solids* in prescribed inside containers will be reduced in *width to 2½" from 3".*

(10) *Sec. 361 (K)* The weight of Class B. poisonous solids now authorized at 115 lbs. net in the I.C.C. 21A fiber drum is increased to 225 lbs. net.

The same proviso's for an extra asphalt laminated ply in the sidewall and heading and added drop tests as prescribed under No. 8 above apply in this instance.

(11) *Sec. 402(p)* Shipments in *carload and truckload lots* by freight, express, or over the highway and when unloaded by consignee are not now required to be labelled. This change also *exempts* such shipments from *marking name of contents on containers.* The exception does not apply to Class A and Class C poisons.

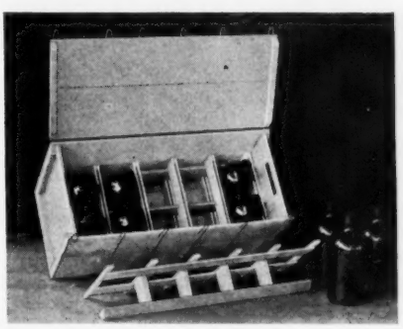
(12) *Container Spec. 2J, 2K, 2L, 12B, 13, 22A, 36A, 36B, 44B, 45B.* The ream of paper consisting of 480 sheets size 24" x 36" is changed to 500 sheets of the same dimensions.

(13) *Container Spec. 12B, 12E, 22A.* The kraft tape specified may be reduced in width from 3" to 2½".

(14) *Container Spec. 22A—Plywood Drums.* Certain changes in the details of this specification concern hoops, head liners, head battens, and closure of heads.

(15) *Tank Car Spec. 103B.* 25 tank cars may be equipped with special safety vents equipped with porous carbon cylinders. These cars are for use in transporting hydrochloric acid 20°Be and weaker.

Solves Shortage Problem



Shortages in shipping containers cause a serious problem for manufacturers in many industries. Illustration shows how many producers of acids are meeting their shortage problem with bottles packed in General All-Bound Boxes. In addition, the General All-Bound Box gives the producers many important advantages.

Export Licenses for Drums

Growing shortages of metal drums and containers and gas cylinders have impelled further restrictions in exports of these articles by the Office of Exports, Board of Economic Warfare. The restrictions implement export controls announced on February 11, 1942.

Exporters have been notified that, effective July 15, 1942, new export controls will be adopted with respect to shipment of such containers, either filled or unfilled. Under those controls metal drums and containers with a capacity of 10 gallons or less, when filled with commodities authorized for export, may be shipped to all destinations under general license, provided the drums and containers are of a type reasonably suited for exportation of such commodities.

On July 15, 1942, exportations of metal drums and containers exceeding 10 gallons in capacity must be authorized by individual export licenses, except in the cases listed below. Applications involving products desired for exportation in metal drums and containers must also list and describe, on the same application, the metal drums and containers which are to be used in the exportation of the products named on the application. The exceptions to this requirement are as follows:

(1) All such drums and containers, filled or unfilled, may be shipped under general license to Canada, Great Britain and Northern Ireland, Newfoundland, Greenland, Iceland, and the U. S. S. R. only.

(2) Such metal drums and containers may be exported under general license when filled with chemicals or petroleum products, the exportation of which has been authorized by an individual license issued prior to July 15, 1942. Applications received by the Office of Exports on and after that date must specify both the petroleum or chemical contents and the containers as well.

(3) Filled metal drums and containers exceeding 10 gallons in capacity, utilized for the exportation of commodities authorized for exportation under general license to destinations *other* than Canada, Great Britain and Northern Ireland, Newfoundland, Greenland, Iceland and the U. S. S. R. will require individual export licenses, on and after July 15, 1942.

Filled or unfilled metal cylinders designed to hold gases, regardless of capacity, may be shipped under general license to Canada, Great Britain and Northern Ireland, Newfoundland, Greenland, Iceland, and the U. S. S. R. only. Exportations to other destinations of metal gas cylinders, regardless of size or capacity, will require export license applications covering both the cylinders and their contents on the same form.

Unlimited licenses issued to the British Purchasing Commission, the Universal Trading Corporation, the Netherlands Purchasing Commission, and the Belgian Congo Purchasing Commission, authorizing exports of metal drums are not affected by these regulations.

The unlimited licenses held by certain American oil refining companies under which they are permitted to export metal drums and containers in any quantity to the other American republics will be revoked July 15, 1942. Holders of such licenses thereafter will be subject to the foregoing regulations.

It is suggested by the Office of Exports that license applications bear a statement to the effect that metal drums, containers, or gas cylinders will be returned promptly to the United States as soon as emptied, if the consignee has agreed to their return. Such applications will receive additional consideration. Applications for licenses to export metal drums and containers to be filled with commodities which can be shipped in wooden barrels, cardboard or other types of containers should not be submitted.

Limits Drum Painting

Coatings containing certain organic binders or pigments may not be used for coating steel containers of two gallons or greater capacity after June 20 by the terms of General Conservation Order

(*Continued on page 104*)

THE DRUMS OF WAR . .
Keep 'em Rolling!
Fifty pounds of steel! Shall we use it for a shell . . . or a drum?
Shells *must* come first. Drums *must* be made to last longer.
Handle them carefully . . . empty them promptly . . . return them immediately. *Let's keep the drums rolling.*
To Handle Drums for Victory
Roll drums off trucks or loading platforms—DON'T DROP THEM!
Don't rinse empty drums—just replace bungs and tighten securely.
Don't contaminate drums by filling with other materials.
Return drums as soon as empty.
FOR VICTORY, make every drum go on as MANY round trips as possible—as OFTEN as possible.
KEEP THE DRUMS ROLLING AND THE SHELLS FLYING

Commercial Solvents Corporation has recently started distributing copies of the above poster to customers and has arranged to have an additional supply printed to be distributed free as long as they last. Poster is in two colors, 9½ by 12½ inches, and is offered regardless of whether you are a customer of the company or not. Company also prints a small label with the headline "Keep the Drums Rolling . . . . . for Victory!" which contains the suggestions listed in the box at the lower right hand corner of the poster. It suggests that other companies use a similar label to place on all 55-gallon drums shipped from their plants.

Which one of these packages didn't spill?

THE first covered wagon almost stumped its inventors, the early Dutch settlers of Pennsylvania.

At first it was just a box on wheels, with a "poke bonnet" hood to keep the contents dry. But things spilled out. You could pack a lot in the wagon because it was big, but too much of your load would tumble out as it jolted up and down rough hills and roads.

So those Dutch wagon designers of the Conestoga Valley did something. Something quite simple. They slanted the ends of the wagon outward and curved the bottom. The effect looked roughly like a rowboat. Things didn't spill as much—tended to settle toward the center. More, these "rowboat" bodies floated easily across streams.

The rumble of the good-looking, blue and red Conestoga wagon was one of the important sounds in American history. It couldn't have been—if the "package design" hadn't been successful. It was practical. It protected its contents. It filled a specific need.

Our success in designing and developing packages for specific needs is the reason why more than 12,000 businesses call Continental "packaging headquarters." Today, however, war efforts come first.

The experience and resources of Continental are now enlisted in helping the nation. Besides millions of food containers for civilian America, for our fighting forces, and for our Allies, we are producing other packages to protect America.

Anticipating another day, we see many new applications of the things we are learning and doing now. If you are looking ahead or developing an idea, we'll be glad to help you. Our packaging engineers, research men and designers are at your service at all times.

What will be the PACKAGE of the FUTURE?

The package of the future will be the package that best meets *all* these 10 important points:

1. Protects against light, heat, and dirt.
2. Does not chip, break, or tear.
3. Is adaptable to *highest* speed filling operations.
4. Is economical to pack, ship, and handle.
5. Light weight, compact, no waste space.
6. Moisture and vapor proof, impervious to temperature changes.
7. Easy and convenient to display, sell.
8. Available in wide variety of sizes, shapes, styles (over 500).
9. Offers maximum convenience and safety in consumer usage.
10. Permits high processing temperatures, certain hermetic sealing.

These points made the metal container *first* in packaging. If there ever is another package that has *all* these qualifications, we'll be making it!

CONTINENTAL CAN COMPANY

Packaging Headquarters for Industry

NEW EQUIPMENT

Motors for Magnesium Dust Locations QC 182

A new line of polyphase induction motors in sizes from 1 to 20 horsepower, NEMA frames 203 to 326 inclusive, suitable for use under magnesium dust conditions has been announced by the General Electric Company. Labeled as suitable for Class II, Group E locations, the new line should find extensive use in the rapidly growing number of plants handling magnesium, particularly where fine magnesium dust is encountered.

The new line has been developed to meet a need brought about by the extensive use of magnesium and aluminum in war production. In many cases, motors are being subjected to these metals in the form of fine powder, as used in incendiary bombs and for other military purposes, or from castings during grinding or polishing operations. Since these dusts are extremely combustible, they present a hazard classified by the National Electrical Code as Class II, Group E, requiring special motors and control.

The design of the new line of motors is based on a series of tests recently initiated by G. E. at the Underwriters' Laboratories, Inc., in which a sample 15-hp, 1800-rpm motor was subjected to a cloud of fine magnesium dust while operating under heating and cooling cycles simulating several years' operation in an industrial plant. Careful examinations of the motor after these tests indicated that it had successfully withstood all tests.

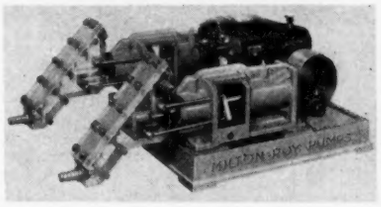
These motors are totally enclosed, with a non-ventilated construction in the smaller ratings and a fan-cooled construction above 2 hp. Simple cast-iron end shields, stator frames, and fan housings make possible dust-tightness without complicating assembly or disassembly.

Other features of the new line include non-sparking bronze external fans, relatively straight and smooth external ventilating passages (for fan-cooled motors) to facilitate cleaning, permanently sealed-in leads, and a rotating labyrinth seal at the shaft opening.

Step-Valve Pump QC 183

Milton Roy Pumps is offering an improved model plastics pump in which the Step-Valve and inlet and discharge connections are made entirely from transparent plastics. This pump is recommended for handling alum solutions, hypochlorites, weak acids, mineral and animal oils and many other liquids, the "Plexiglas" valve being unaffected by most inorganic solutions and by alkalis and oxidizing acids only in high concentrations.

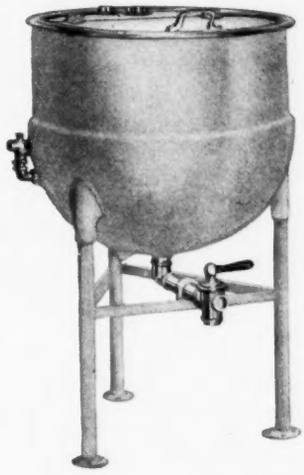
The pump is of typical Step-Valve design, with double-ball ground glass checks and adjustable stroke for accurate control of volume from one quart per hour up to maximum capacity. Duplex models will handle up to 100 g. p. h., Simplex models up to 50 g. p. h., against pressures as high as 150 lbs. per sq. in.



Single-piece cover plates for this plastics valve are readily removable without distributing connections, and the manufacturer states that this valve, like Milton Roy Step-Valves made of corrosion-resistant alloys and other metals, is non-clogging, self-cleaning and eliminates all possibility of air-binding. The transparency of the plastics material makes it possible to watch the pump function and to detect discoloration or dirt particles in the liquid as it passes through the valve.

Clad-Steel Kettles QC 184

Stainless-clad steel kettles are now being used to help conserve materials in the new "Defense Kettle" made by Groen Manufacturing Co., Inc. A considerable number of these units are being constructed of Silver-Ply Stainless-Clad



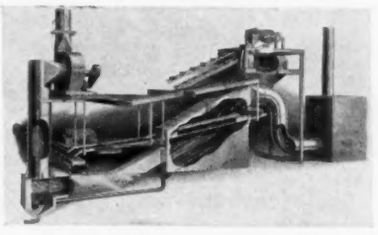
Steel, furnished by the Jessop Steel Co. The entire inside and the cover are protected by a stainless steel surface. The kettles are said to have the desirable features of solid stainless steel kettles and based on initial acceptance the company says that they will shortly be seen in wide use.

Stainless-clad steel is being used more extensively during the present emergency as a substitute for solid stainless, because the relatively thin layer of stainless in the clad product requires less alloy and yet effects the desired corrosion resistance. A twenty per cent sheet or plate of stainless-clad steel, for example, saves four-fifths of the stainless steel required in a comparable sheet or plate of solid stainless.

New Coal Dryer QC 185

Link-Belt Company has developed a new dryer for the removal of surface moisture from sized coal. This dryer, to be known as the Link-Belt "SS" Dryer, combines mechanical dehydration with heat drying, and is available for drying sized coal of No. 10 mesh and up.

The new unit comprises a drying chamber with perforated reciprocating-plate drying surface; coal inlet and outlet; hot air inlet from a coal-fired furnace; and an exhaust fan for drawing the hot air into chamber, over and through the thin bed of coal, down through perforations in reciprocating plate, to exhaust stack.



The operation of the moving element is analogous to that of the familiar shaker screen excepting that in the case of the "SS" Dryer the perforations are very small and are intended only for passage of the drying air.

It is stated that inasmuch as the coal passes through the dryer in a thin bed at slow speed, it is thoroughly, uniformly dried with low temperature air and discharged relatively cool; also that comparatively little power is required for operation of exhaust fan and reciprocating plate.

Chemical Industries
522 Fifth Ave., N. Y. City.

I would like to receive more detailed information on the following equipment: (Kindly check those desired.)

QC 182 QC 183 QC 184 QC 185

Name .....

Title ..... **Company** .....

Address .....

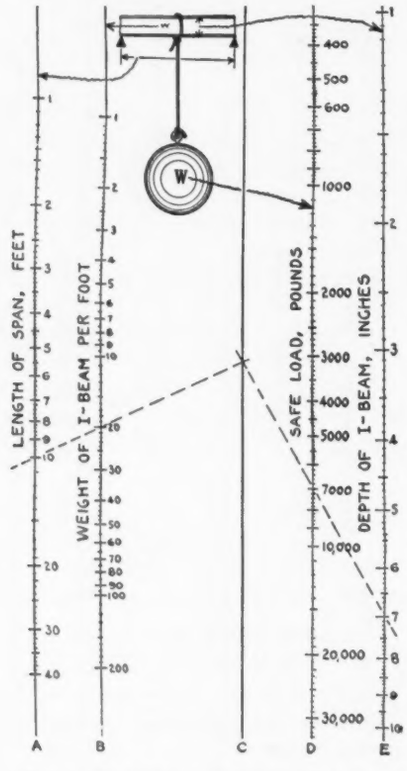
PLANT OPERATIONS NOTEBOOK

A USEFUL I-BEAM CHART

By W. F. Schaphorst

Chemists sometimes have heavy loads to supervise, involving the need of steel beams.

Tables are available in steel handbooks for giving the strength of I-Beams, of course, and it is advisable to use such tables for permanent important work. But in the event that you want a quick estimate here is a chart that will be found useful for determining the size of steel I-Beam to use. The I-Beam, as every reader doubtless knows, is the lightest and most economical steel beam for most purposes.



Inasmuch as a concentrated load at the middle of the beam represents the very worst condition, as shown in the sketch on the chart, requiring the largest beam for a given load, this chart is based on such loading for the sake of safety.

The wavy arrow lines running from the sketch to the various vertical chart lines show at a glance just what each chart column means.

For example let us suppose that you want to support a weight of 4,000 pounds. You find that you have on hand, or can buy from a scrap dealer, a 7-inch I-Beam weighing 240 pounds. It is 12 ft. long and therefore weighs 20 lb. per ft. The minimum distance between supports that can be obtained for holding the 4,000-lb. load is 10 feet. Is the I-Beam strong enough for your purpose?

The dotted lines drawn across the chart show how the problem is solved. Run a straight line through the 10 ft., column A, and the 20 lb., column B, and locate the intersection in column C. Then from that intersection in column C run over to the 7 in. in column E. The intersection through column D shows that your I-Beam will support 7,000 pounds. Since your load is only 4,,000 pounds the beam is amply strong. In fact, you can easily find, by applying the chart, that a 4-inch I-Beam, all other conditions being the same, will safely support your load of 4,000 pounds.

In a similar manner it is easy to ascertain the maximum allowable span when the factors in columns B, D, and E are known. Or, you can find the necessary weight per foot of I-Beam when the factors in columns A, D, and E are known. And lastly, the depth of beam is determinable when the factors in colums A, B, and D are known.

For loads that are "uniformly distributed"—not concentrated—the safe loads in column D may be multiplied by two. Thus, the above described beam will support a uniformly distributed load of 14,000 pounds, or, 1,400 pounds per running foot.

MAINTAINING EXPLOSION-PROOF ELECTRICAL EQUIPMENT

By Phelan McShane

Manager Mining Section, Industrial Engineering Department, Westinghouse Electric and Manufacturing Co.

Many instructions have been compiled on the proper maintenance for explosion resisting apparatus in order to insure safe operating conditions. Fortunately, however, there are certain fundamental rules which cover the important instruction and at the same time can be easily understood and remembered. Equipment should be clean, parts kept tight that should be tight, and free moving parts kept free.

Aside from keeping the equipment clean, the maintenance schedule to be followed in the case of explosion resisting apparatus in exactly that which would be followed in connection with non-explosion-proof apparatus. The motors should be thoroughly blown out at regular intervals, the commutators kept in good condition, and the brushes free in the holders.

The control apparatus should be kept clean by an occasional wiping of all insulating surfaces between live parts. The contactors and relays should be maintained in first-class condition.

While explosion resisting apparatus is thoroughly enclosed, it cannot be hermetically sealed, and due to heating and cooling, air is drawn in and expelled from the enclosure. The air entering the controllers in spite of anything that can be done carries with it coal and other dust. In many instances the dust is conducting, particularly when moist, and for this reason all surfaces within the controllers across which electric leakage is likely to occur should be kept scrupulously clean.

It is realized that it is inconvenient to open up controllers and motors to thoroughly clean the equipment, but it is very much less trouble to do this occasionally than it is to perform major repairs which will certainly follow neglect.

Of interest to both the manufacturers and to those making use of the equipment is a publication of the Bureau of Mines which contains the requirements for explosion resisting apparatus and indicates the proper maintenance practices.

Editor's Note: We invite our readers to send in their comments on these plant operation ideas and to write up short articles on other problems of interest to plant operating men.

CHEMICAL SPECIALTIES

Nuolates, made by Nuodex Products Co., Inc., Elizabeth, N. J., are standardized and stabilized solutions of metal salts of refined, mixed vegetable fatty acids. These standardized liquid driers are introduced as substitutes for civilian use for naphthenates and naphthenic acid taken by Government for war needs.

Industrial Agricultural Household

N.A.I.D.M. airs its war problems

At 28th Semi-annual Meeting in Chicago

By Paul B. Slawter Jr., *Assistant Editor*

The Edgewater Beach Hotel last month was the scene of one of the most important meetings of the NAIDM since the beginning of the war. What the problems of the industry are and how they can be solved or alleviated according to the experts are included in this convention report.

THE largest number of manufacturers and their representatives ever to gather for all sessions at a convention of its kind met at the Edgewater Beach Hotel in Chicago June 8 and 9 for the 28th semi-annual meeting of the National Association of Insecticide and Disinfectant Manufacturers, Inc. The effect of the war program on the industry and the hope of finding out some of the things to come were responsible for the record-breaking interest.

In a two-day session which was devoted to such enveloping topics as the use of insecticides and disinfectants in army, war plant and home, the public health aspects of the war, raw material and finished goods priorities, symposiums on raw materials and containers, and the relation of WPB and OPA to the NAIDM, the association gave the 200 or more who attended exactly what they asked for.

Two motions that were unanimously adopted by the association concerned defense emergency specifications for disinfectants and an increase in membership dues.

The Emergency Specifications

Dr. E. G. Klarmann, chairman of the disinfectant scientific and commercial standards committee, offered the meeting the four proposed phenolic disinfectant specifications for use during the present emergency. (These specifications were covered in full in Association Bulletin No. 31, March 16, 1942.)

Specifications "A" and "B," modifications of CS70 and CS71 respectively, are expected to take care of the existing shortage of raw materials for phenolic disinfectants of both the emulsifying and the soluble types, by eliminating the requirements as to minimum content of active ingredients, and the maximum of water. Specifications "C" and "D" are new in character; the former is intended to cover disinfectants from synthetic phenols, the latter fortified phenolic disinfectants, that is, those of either the emulsified or the soluble type to which a fortifying agent of synthetic origin has been added.

It was voted that the association adopt the specifications "A," "B," "C" and "D," as recommended by the disinfectant scientific and commercial standards committee, for use during the war emergency.

President Opens Meeting

John N. Curlett, president of the association, opened the mid-year meeting with a welcome and an explanation that the change in location from Hershey, Pa., to Chicago was decided upon because of the transportation situation.

"Never before in the history of our association," he said, "has the membership been confronted with as many new and different problems on which there are no precedents. When the conditions for doing business are changing so fast on such a basis, there is much confusion. However, I think we as an industry, should feel most happy that the products represented have a definite place in the war effort. Our products are used for maintaining the public health of our armed forces as well as the health of our civilian population. Many of our companies manufacture products used in agriculture which again is an important factor in our economy. Both from a public health as well as an agricultural standpoint our membership is performing a very important function."

Curlett, who was with McCormick & Co. until drafted by the WPB last year, assured the gathering that there is but one objective in the mind of the $1-per-year men—to win the war. "There is a slogan in many offices in Washington," he said, " 'Time is Short'. Its meaning is not only applicable to functions of government, it is true of the operation of our armies, our navies and business as well, it further implies that it is necessary for all, no matter what their part in winning this war, to keep on their toes. Be flexible so that shifts and changes may be made quickly and with as little confusion as possible."

The Secretary Reports

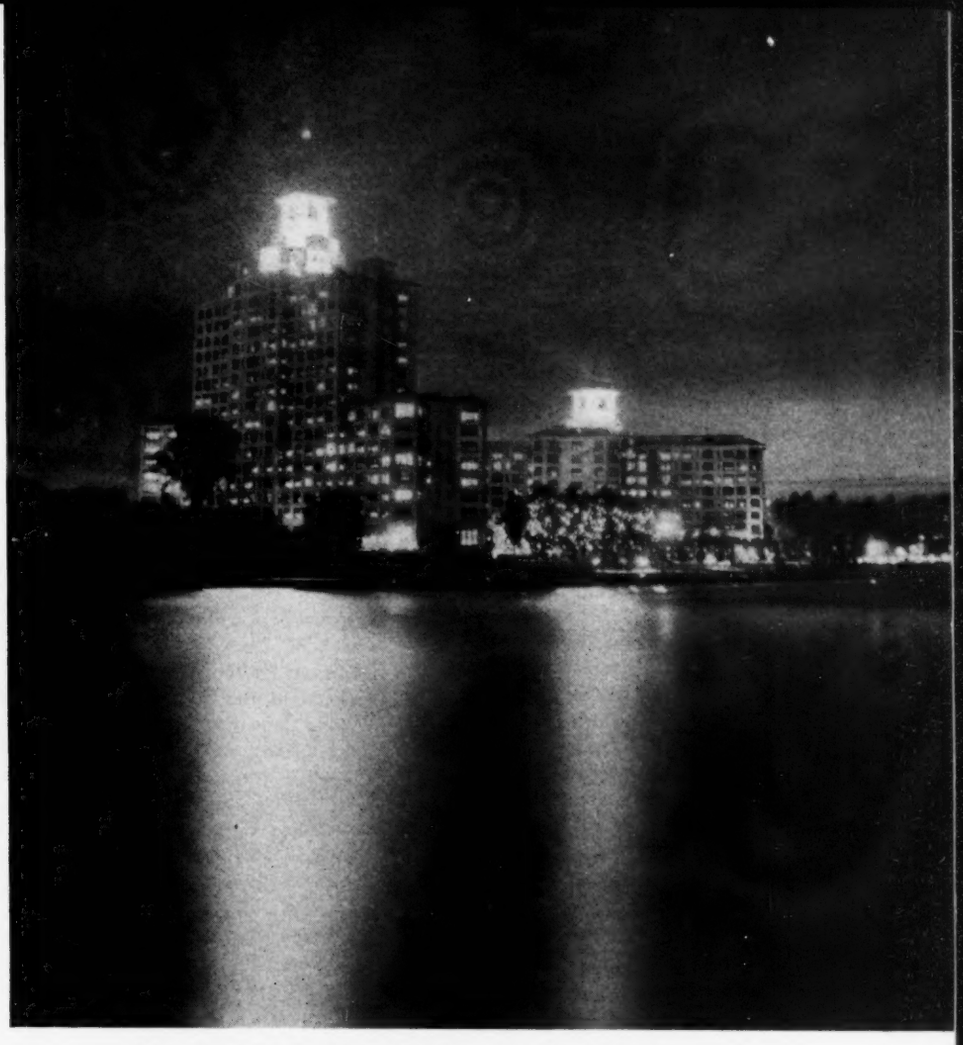
Reporting on the work of the executive office of the association for the first half of 1942, H. W. Hamilton, secretary, told of the work of the legislatures and said that "during the past few months, the model bill has been completed and it is now felt that the association has a model form of an insecticide and fungicide bill, meeting all the requirements of our industry. It is not our intention to use this model bill except in cases where new bills are offered for the regulation of insecticides, etc., or where unworkable provisions are being considered.

"The 1942 Official Test Insecticide has been available at the executive office since May 15th for distribution to members and non-members. The 1942 O. T. I. is official for use until June 1, 1943. A very small quantity of the 1941 O. T. I. was left on hand when the 1942 O. T. I. became official on June 1. Incidentally, it is well to note that during the past year the preparation and distribution of the O. T. I. was carried on without any financial loss to the association. We believe the practice adopted by the association for payment has proven successful and there appears to be no reason why the preparation and sale cannot be continued without a loss in the future."

The secretary went on to point out that one of the major efforts of the executive office during the past six months has been concerned with the relations of this industry to the war effort. The various orders and ruling being made by Federal agencies involved in the coordinating of civilian activities in general, and with war requirements, are constantly being scrutinized in the executive office.

"Through our Washington representative, H. C. Fuller," he said, "we have been kept in very close touch with the various boards. When information has come to the attention of the executive office, the important facts have been bulletined immediately to members, either in their entirety or in part as the particular circumstance required. It has been our endeavor to send out only definite orders and rulings that affect our industry so as to avoid misinformation and confusion.

"Under Conservation Order M-81 (Tin order), the association filed protest and requested clarification of definitions. A brief was prepared and submitted through Mr. Fuller to the proper board heads in Washington. We have received an indication of some success in this instance but the matter is still under consideration. Through Mr. Fuller's office various interpretations of rulings, orders, definitions, etc. have been clarified for the benefit of our members."



From the lake at night, the Edgewater Beach Hotel.

Mr. Hamilton warned that it is no secret that we can expect further administrative orders affecting almost every branch of our industry. In addition to new orders, there are the constant changes of rulings which may result in cancellation of orders or in extension of orders. The information furnished by the association office is of necessity of a basic nature. How it will apply to each member's particular business is often a matter of interpretation. Where ques-

Some shots taken at the meeting. Top photo shows H. C. Fuller, Washington representative of the association, delivering his paper. At the right is Mrs. E. D. Sullivan, secretary of the N.A.I.D.M. Below that, all the way from Cambridge, Mass., came Guy B. Robbins, president, George B. Robbins Disinfectant Co. Below him, Edmund C. Kratsch, secretary, National Sanitary Supply Association. Lower left, Henry A. Nelson (Chemical Supply Co.), chairman of the membership committee, reports on new members. Below, Gordon M. Baird and Jack Varley, Baird & McGuire, Inc.

tions arise as to the application to your own particular set-up, it might be well to consult your local or regional boards, he added.

Nine New Members

The following new members were reported by Henry A. Nelson, chairman of the membership committee and welcomed at the meeting. (This brings the membership total to 105 active, 33 associate and two honorary members.)

ACTIVE: Ampion Corporation and Associate, 4-88 47th Ave., Long Island City, N. Y.; Wm. Cooper & Nephews, Inc., 1909 Clifton Ave., Chicago, Ill.; Grand Rapids Chemical Co., 5 Colfax St. N. E., Grand Rapids, Mich.; Hunt Manufacturing Co., Lisbon & Buckeye Rd., Cleveland, Ohio; Franklin Research Corp., 5134 Lancaster Ave., Phila., Pa.; Orbis Products Corp., 215 Pearl St., New York City; Puritan Chemical Co., 209 Peters St., Atlanta, Ga.; Worrell Manufacturing Co., 1470 South Vandeventer, St. Louis, Mo.

ASSOCIATE: Crown Can Co., Erie Ave. & H St., Phila., Pa.

Dr. Badertscher Reports

The insecticide-scientific committee, according to a report by its chairman, Dr. A. Edison Badertscher, McCormick & Co., has been hard at work for the past six months. Some of the things it has accomplished include:

(1) Tests in progress at Ohio State University have been completed and the data are being studied and placed with Dr. Simanton for evaluation. A report of this will be given at the next meeting.

(2) The moth-proofing committee, after considerable research, has arrived at a test method for tentative adoption. This test method, somewhat like the official one, is still subject to revision and needs several years of experimentation.

(3) Base oil specifications for household insecticides are being studied now for later recommendations.

(4) The cattle spray committee also has under study certain specifications which are being drawn up.

(5) The chemical analysis committee has considerable data on pyrethrum which can be obtained by the members.

The World War Situation

Envisioning a new world after the war in which the basic principle will be good faith, Donald McGibney, CBS Radio News Commentator, Chicago, gave the audience a picture of the war on all fronts in his talk on "News, Views and Previews."

The expert summed up the position of the war as being not too good but not too bad for our side. He predicted that an attack on Alaska by the Japs will bring Russia and Japan to blows. He predicted an attack on Siberia by Japan. He said that the German Army higher-ups are against Hitler. He predicted that Gibraltar will fall in an attack which will see the use of high explosives and gas.

The entire world has to be fed and rebuilt after this war, the radio commentator said. It is going to mean a pooling of resources into an international cartel and it will mean a great deal of "giving away." The great trade areas of the world, said McGibney, will be divided up so that the nations will share equally.

"An international police force will patrol the world," McGibney concluded, "and the U. S. for the next 300 years will be the arbiter and judge of affairs of the entire world."

Use in the Home

What the housewife wants from the insecticide and disinfectant industry was told by Mrs. Ruth Crowley, columnist, of the "Chicago Sun" in a talk entitled "The Use of Insecticides and Disinfectants in the Home."

Advertising the jobs that your products are equipped to do helps the woman in her fight against disease germs, Mrs. Crowley told the group. She urged the industry, if it is at all possible, to give the women products that do not smell bad. "We want gargles that taste good, too," she said.

"What the woman looks for from you," Mrs. Crowley said, "are:

"(1) Dependable disinfectants (in addition to soap) which are safe to use where there are children and which do not smell too terribly.

"(2) Insecticides to help against pests which are also safe and comparatively odorless.

"(3) Antiseptics which are effective and pleasant to use and which have specific or general uses."

Use in the War Program

"The war between man and the insect world has been continual and relentless," said P. A. Surgeon, Dr. John E. Dunn, U. S. Public Health Service, Washington, in his address, "The Use of Insecticides and Disinfectants in the War Program." The ideal insecticide, he told the group, would be one completely effective in eliminating the insect and yet innocuous to humans.

Dr. Dunn concerned his talk with the second aspect of this ideal insecticide—innocuousness to humans and the dermatitis hazards associated with such agents.

Dividing insecticides into two classes, organic and inorganic, Dr. Dunn expanded upon the many different types and discussed the effects of different products on human beings. There is a relentless search going on, he said, for non-toxic substances and the answer seems to be in the organic branch of chemistry. This is a good time to develop synthetics now that we have been cut off from many of the natural organic products that we were using before the war.

He cited a number of synthetic products already in use—the thiocyanates, the amines and the organic sulfur compounds and said that research in this direction was already going forward in several different phases.

"There is a great need for the discovery and synthesis of new insecticides and fungicides at the present time," Dr. Dunn said in conclusion, "not only to replace some of the sources of natural products lost on account of the war but also to provide better products than some of those now in use. Food is vital to the prosecution of war and we can little afford to share it with our insect pests.

"The war has brought new problems in combating insects that cause or transmit disease. Troops must be kept free of these parasites if they are to function most efficiently. While we do have effective means for controlling most of these insects, there is ample room for improvement in the development of such agents as insect repellents, fumigants, anti-acabetic preparations, larvacides, etc. Large groups of our civilian population have also been disrupted on account of the war and the development of war industries. They, too, must be kept free of disease.

"But in producing these new synthetic insecticides the chemist must ever bear in mind that they must not be toxic to human beings."

How Industry Can Help

War has always been accompanied by an increase in disease and the foremost diseases affecting the soldier are those which are carried by insects, Major Joel I. Connolly, assistant to the president, Health Department, City of Chicago, said in his address before the group Monday afternoon entitled "What Can the Industry Do to Help Preserve Health in Congested City Areas Under Wartime Conditions?"

Today, no matter how far you are from the battlefront, he said, the battlefield is where you are. Disease reaches the people behind the lines as well as the soldiers. Since we need 18 men back home to keep one man at the front it is necessary that the health of everyone be protected. Great attention must be focused on industrial and domestic sanitation now.

"So far," Major Connolly said, "gas has not been used in this war. There are rumors that it has been. The day may come when it will be used on a large scale. There may be a projected use of disease organisms in warfare and they may not be transmitted through

water supplies as you might imagine because this can easily be detected. The means might be through the use of insects and rodents infected with typhus, bubonic plague etc. They could be planted by saboteurs. We must be prepared for these things."

There are still conditions of squalor in the U. S. that must be eradicated, said Major Connolly. We can't afford to neglect proper sanitation in any section of the country. The greatest weapon for us to use is education. He called upon the industry to become the means of this education program. You can do it by teaching them how to use tools to control disease and insects, he said. Manufacturers of insecticides and disinfectants can do no greater service than this. He urged those present to do everything in their power to teach the people of this country that rats must be killed along with vermin, lice and insects. He called for instructive advertising in news releases, house organs and wherever articles can be published. He said that the surgeon general's office in Washington could supply any information about the prevalence of disease and that it should be used by the members accordingly.

This question, he said in conclusion, is so important at this time that members should consider it their duty immediately to enlist the help of their civilian defense officials in their community in taking these matters into hand. "You've got the knowledge and the experience to do it," he said, "spread the good word and work."

Public Health Aspect

"The Public Health Aspect of Household Insecticides and Disinfectants" was the subject of the address of H. C. Fuller, NAIDM consultant, Washington, D. C. Mr. Fuller changed his topic, he said, because he had talked enough about trade barriers and price control and had simply gathered a few highlights of the topic under discussion.

Tuesday Session Lively

First report of the second day's session was that of J. L. Brenn for the association's priorities committee. Mr. Brenn covered the highlights of the priorities situation and pointed out that Washington is bending every effort to keep every manufacturer in business.

"The question for you to keep uppermost when dealing with this situation," he told the association, "is 'What is the end use of your product when it is considered for its essentiality?' "

"I would say this," he went on. "Each of you must consider your own business and see how you can operate without the aid of priorities. You are only creating confusion by going to Washington. You've got to be reasonable. Only go to Washington when it is absolutely necessary. War requirements come first. Use the district offices of the WPB; they can help you."

Raw Materials Symposium

By far the most interesting to the chemical industry as a whole, and to the NAIDM membership as evidenced by the attendance records, were the raw materials and container symposiums held Tuesday morning. The association drew upon experts from both industry and government to expand on the topics at hand.

Speaking on "Coal Tar Raw Materials," J. H. Carpenter of Koppers Company explained that his subject was a difficult one since all phenols are now under complete allocation. (The WPB includes cresol, cresylic, acid content of tar acid oils and benzo-phenol in the classification.) "The possible production of cresol," he assured the group, "is far in advance of our needs.

"The coal tar industry," Carpenter said, "is making every possible effort to render available to industry the maximum quantities of acids and acid oils. Crudes with very little acid content, not heretofore used, are being separated far from refining plants and in some instances the cost of transportation and preparation alone is actually in excess of the sales price of the finished product. If the war demand increases (and it is almost assured that it will increase for cresols for resins and plasticizers) the amounts available for the disinfectant industry may become less and less. This may be compensated for by corresponding decrease in demand if additional buyers change their specifications and adopt synthetic disinfectants purchased on a coefficiency basis.

"If all producers of disinfectants," he went on, "are exerting their efforts to take care of requirements as carefully as the WPB has been doing in enabling coal tar raw material producers to take care of acid requirements for distributors under the allocation system, then there should be no complaints."

Pyrethrum and Rotenone

The discussion of "Pyrethrum and Rotenone" by Dr. Alfred Weed, John Powell & Co., must be considered in the light of the government orders affecting them; general preference order M-179 was issued June 13 allocating pyrethrum and certain changes were announced June 6 to the rotenone order M-133.

Producing countries reported light crops of pyrethrum for the first six months of this year, Dr. Weed said. This, coupled with excessive damage caused by the monsoons and negligible shipments, makes supplies here short. From Sept. 1941 to April 1942 there were 4,000 tons shipped to the U. S., he said. From May 1942 to Sept. 1942 the figure should be about 3,000. Plantings, however, are on the increase and there is every indication that supplies will be adequate, if shipping can be obtained.

Production reaching 10,000 tons is expected, Dr. Weed added.

As for possibilities of South American supplies, Dr. Weed feels that on the whole the quality of the flowers is not too good. Brazil and Peruvian production may be taken by this country depending upon the outcome of government negotiations now in progress.

The rotenone supply, he said, seems to indicate that there will be adequate materials for agricultural needs unless something unforseen happens. The future depends upon negotiations under way between Washington and South America.

Dr. Weed mentioned the changes in the rotenone order M-133 according to which rotenone may be used as an insecticide in the treatment of cattle for grubs, but may not be used as a germicide for citrus fruits. WPB states that "Citrus fruits are one of the products that can be protected adequately with an insecticide other than one containing rotenone; cattle grubs are combatted best with the rotenone compound, acceptable substitutes not being available. Order M-133 was amended, therefore, to forbid use of rotenone for citrus fruits, except with specific authorization by the Director of Industry Operations, and *to permit its use as a spray, wash, or dust for the treatment of cattle to destroy grubs, but not for usual cattle insecticidal purposes.*"

Pine Oil

Production of pine oil in the next 12 months—from 55 to 56,000,000 pounds—should be able to take care of any reasonable demands from industry, Frank Rapp, Hercules Powder Co., told the session on Raw Materials in his address, "Pine Oil."

The pine oil industry, he showed, has had a phenomenal growth since 1910. He told of pine oil's increasing list of uses and said that the industry grew 642% in the first 10 years. From 1920 to 1930 it grew another 485% and in the last decade jumped another 124%. Production in 1941 amounted to 47,000,000 pounds.

Because they work 24 hours a day, 365 days a year, Rapp said, pine oil producers cannot increase their production except through new plants. Synthetic pine oil, now in its experimental stages, may be able to relieve some of the pressure on the natural product.

Insect Sprays

"Synthetic toxics for Insect Sprays" was the topic of the last speaker on the Raw Materials Symposium, Ira MacNair, MacNair-Dorland Co. MacNair told of

the changes of a continued supply of the synthetics for household insecticide manufacture but said that on the whole the situation is not too serious. "Shortages and priorities are interfering with some items, as you know," he said.

He characterized his report, taken from information supplied by major producers, as "perhaps too optimistic."

Ample supplies are likely to be available over the next year at least, he pointed out.

Container Symposium

The container symposium — another crowded session — was one that every delegate had in mind before leaving for Chicago and one that cleared up a lot of difficulties for members.

Roger V. Wilson, Continental Can Co., presented in his paper on "Cans" the fact that the future of cans is black—very black. He told of the restrictions imposed upon the tin can industry and mentioned its progress in developing substitutes. Use of terneplate and the reduction of tin content in cans played an important part in the early solution.

The ultimate goal of the tin conservation program, he said, has been the complete elimination of tin on plates for cans. Shortages in a number of raw materials needed for the manufacture of tin containers are felt in every direction, he said.

The other half of the problem, Wilson added, is your job. You must adopt your merchandising now to the different styles, sizes and production of containers.

The Financial Situation

Guy E. Reed, vice-president, Harris Trust & Savings Bank, Chicago, discussed "The Financial Situation" before the group in which he pointed out that we will finance the war and pass through the adjustment period with a minimum of trouble if "we play the part as human beings."

"This is the grandest opportunity ever for a nation to lead the world in a compassionate and human policy," he said.

Drums

Briefly reviewing the moves that steel container manufacturers have taken during the past eight or ten months, Gordon D. Zuck, Wilson & Bennett Mfg. Co., brought the audience up to date in his address on "Drums." He told of the government's program which was designed to taper off the availablility of steel for drums so that the manufacturers would develop substitutes. He showed how this move had been met by the manufacturers. In some cases, he said, the substitutes have been found to be better than the originals. Drums lined with lacquer and enamels have been developed and perfected which practically eliminate galvanized and tin lined drums.

The program of standardization in styles and sizes will have its benefits, too, Zuck said. In many cases we won't jump back into the old methods of doing things. This standardization is advantageous from the standpoint of the manufacturers of containers as well as their customers.

Bottles and Closures

The glass container situation is by no means clear, Dr. Julian H. Toulouse of the Containers Division, WPB, said in his talk on "Bottles and Closures" at the container symposium. Although the glass container industry is not yet pushed to capacity no new machinery for production is planned. It can take a certain amount of expansion, probably about 30%.

Standardization is the program for glass, Dr. Toulouse said, and the users will have to adjust their businesses to fewer sizes and fewer shapes along with a prevalence of larger containers. He said that the glass industry is moving fast toward this standardization and is endeavoring to use less glass by changing designs. A standardization group is at work on the problem and consulting with industry groups such as the NAIDM, he said.

In their experimentation, the containers division researchers have found the best shape for the program to be a cylinder with the length and height equal. The trend of production will be toward plain round bottles, known as Boston Rounds, and to the wide rounds.

Dr. Toulouse called for the cooperation of the industry in helping get the program into shape and urged the members "to tell us how you can standardize sizes." Schedules will be issued, he said, freezing all designs.

Steel Containers

Pointing his talk in one direction in a call for immediate voluntary action, Donald C. Knapp, Chemicals Branch, WPB, spoke on "Steel Containers" and sounded the keynote of his division when he said "I hope you will take steel out of containers and put it into war materials. I hope you will start now. The WPB may be along soon to help you, but it is up to you to do the job."

"Our problem of containers is the problem of steel," he said. "It is serious —deadly serious. It demands action. I am going to ask you to take action at once. I am *asking*, mind you, not *telling*. When I clear up in your minds the real function of the War Production Board then you will see how we can help you, and you will see what you can do, and how.

"I would like to see you start now," he went on, "each of you, individually. Don't wait for your competitor to lead the way. Don't get out on a limb without good supplier connections. Build up your supplies of wood, fibre, and glass containers. Use them along with your metal ones as long as you can. Then, when metal use of containers is restricted, you will be affected very little.

"If you are worried about the effect of substitute containers on your competitive position, remember that he who waits may not be able to ship at all. Who is in the best competitive position then?

"I won't say more about the steel shortage. You know it as well as I. And I know perfectly well that you want to help meet it.

"Get me straight on one point," he continued. "I speak for the War Production Board when I say that we do not want to put anyone out of business. We do not want to upset your business in any particular. Our job is to keep you in business if that is humanly possible in the face of military necessity. We want to show how you can support the war effort and stay in business too.

"Some of you may think that we ask damn fool questions. You should see some of the answers we get. Quite often we have to ask for additional information, such as inventory position and a statement on the reasons why substitutes for steel drums can not be used. Many times applicants do not answer this question at all. This leads me to believe that there isn't any reason why he can't use a substitute. Another answer which doesn't deserve much consideration is "none" n-o-n-e.

"Others that are used, more often than you might believe, include 'glass will break, wood leaks, ralroads won't accept any package other than steel' or that I.C.C. regulations say 'liquids must be packed in steel.'

"I have shipped thousands of glass carboys of such liquid materials as sulfuric acid by rail, and I have read the I.C.C. regulations until I am blue in the face, and I can't find any of these so-called reasons.

"Check your shipping regulations carefully and if there are regulations which apply to your product, if you wll give us the source of the regulation and the section number, then we will know what you are talking about.

"We can not give blanket ratings for the use of steel containers. We must know each item that requires metal contaners, and how many they require—the size, gauge—so that we may judge whether the material is essential, and whether it actually does require a metal container, or whether substitution is possible.

"I have in my office in Washington samples of a new fibre board drum. It has a wooden top, with a steel band

(*Continued on page 106*)

Why buy just any Solvent?

Extra Values *from* FURFURAL

1. Selectivity
2. Penetration
3. Resistivity
4. Wetting
5. Recoverability

Don't be satisfied with just dissolving action, when perhaps you can gain some extra value by selecting the proper solvent. That "something extra" is what many manufacturers like about Furfural. And remember—in tankcar lots a dime buys better than a pound of Furfural.

Furfural

It is the abrasive wheel manufacturers' best solvent for phenolic resin. The bonus is the excellent wetting action of the Furfural on abrasive grain, insuring a uniform mix and a strongly bonded product.

Many coating ingredients are soluble in Furfural. The extra is that although Furfural is used primarily as a solvent, frequently it contributes measurably to improved characteristics of the film.

Most notable of all, are the applications of Furfural as a selective solvent. Thus, in petroleum refining, rosin refining and purification of other crudes, unique solvency properties of Furfural permit the separation of closely related substances. The ease with which it is recovered quantitatively adds to its industrial usefulness here.

Additional solvent uses are based on its ability to carry solutes into porous and semi-porous substances. Simultaneously it promotes wetting.

Ask for your copy of the free booklet entitled "The Furans," telling about Furfural and its derivatives. Your specific questions about the uses of Furfural are also invited.

The Furans

FURFURAL
FURFURYL ALCOHOL
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HYDROFURAMIDE

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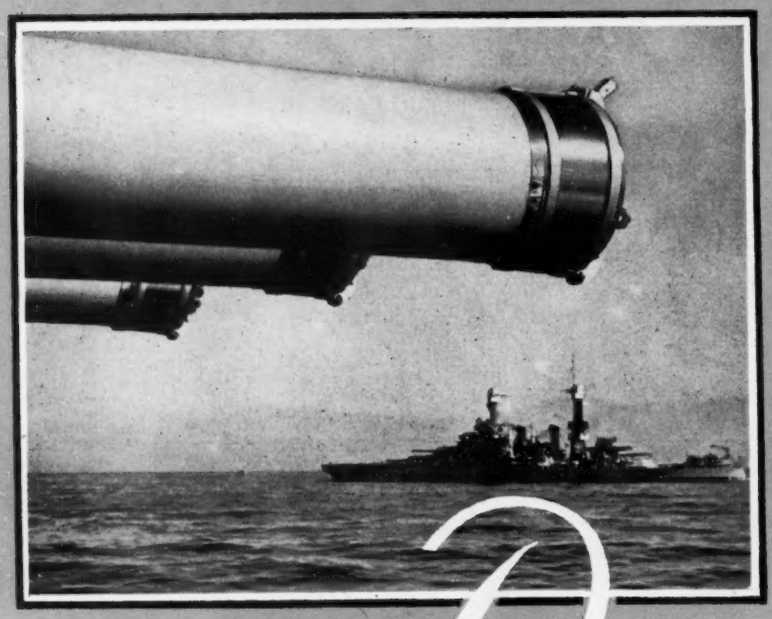
FURFURAL - FURFURYL ALCOHOL - HYDROFURAMIDE
. . . TETRAHYDROFURFURYL ALCOHOL . . .



Dependable!

"STANDARD"

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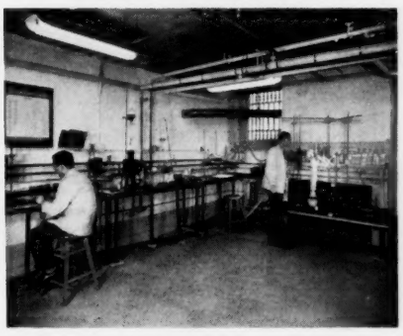
STANDARD CHROMATE DIVISION
Diamond Alkali Company, Painesville, Ohio

Make "STANDARD" Bichromates *your* standard

SHOTS FROM HERE AND THERE IN THE CHEMICAL INDUSTRY

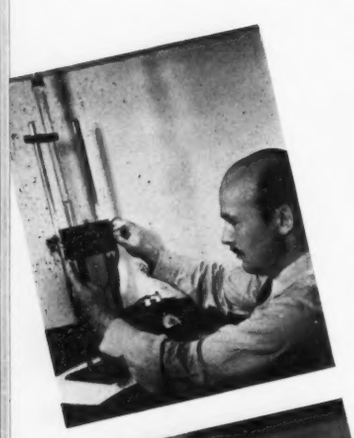
Reichhold Chemicals, Inc., Gets Navy "E". With 90% of its production now going into the armed services, Reichhold Chemicals, Inc., Detroit, was presented June 24 with a Navy "E" pennant for excellence. Here, Commander Robert Velz pins an "E" lapel button on William Fetterly, oldest employee in point of service. Seated at right rear are Rear Admiral William C. Watts, who made the presentation, and Charles J. O'Connor, president of the company. Ceremony also served as dedication of a new laboratory building. In the inset are a group of research men from various plants of the company at Detroit, Elizabeth, N. J., and Brooklyn, N. Y.

E. B. Badger & Sons Co., Cambridge, Mass., was presented with the Navy "E" pennant for excellence in industrial production in ceremonies June 15. Here is the presentation to Erastus B. Badger, president, by Capt. W. D. Puleston, U.S.N. (ret.). Front row extreme right is Gov. Saltonstall of Massachusetts, who was the principal speaker.



Pictured above are some scenes of the new offices of Velsicol Corp., Chicago, Ill. From left to right are: the general laboratory, the distillation laboratory, and part of the core testing laboratory. Plant is at Marshall.

Developments of interest



This remarkable photograph of "Old Glory" was taken by John J. Loughlin, member of the Chemists' Club staff, N. Y. City, with a box camera. He has titled the photo "Invincible"

More than a score of new engineering developments and new ideas that could be put to work to help speed production in almost any war industry were disclosed at the Hotel Astor, N. Y. City, last month to newspaper writers and leading technical magazine editors by the Westinghouse Electric & Mfg. Co.

Top photo shows Dr. A. A. Bates, manager of Chemical and Metallurgical Division adjusting the photo-cell that quickly and accurately indicates the size of metal particles used in powder molding. Below him is F. T. Hague, Manager of Engineering, who answered questions on his division. Below him is C. S. Williams, company expert on magnetic testing. Bottom photo shows E. Griffiths (left) director of time study, explaining simplified copper-brazed stripper to some guests.

SHARPLES

TRI-n-BUTYLAMINE

FORMULA $(C_4H_9)_3N$ MOLECULAR WEIGHT 185.34

SPECIFICATIONS

Color	Light yellow
Specific Gravity at 20°/20°C	0.78
Acid Insoluble	Not over 0.25%
Tributylamine Content	At least 99%
Distillation:	
Initial Boiling Point	Not below 203°C.
Not less than 95%	Below 216°C.
Final Boiling Point	Not above 219°C.

OTHER PROPERTIES

Average Weight per Gallon	6.5 lbs.
Flash Point (Open Cup)	187°F.
*Boiling Point	214°C.
*Specific Gravity at 20°/4°C	0.778
Specific Gravity 60°/15°C	0.755
Melting Point	–70°C.
Refractive Index at 20°C	1.431
*Coefficient of Expansion per deg. C	0.00105
*Surface Tension at 20°C	24.9 dynes/cm.
Viscosity at 25°C	1.35 centipoise
Viscosity at 60°C	0.73 centipoise
Solubility in:	
Water	Insoluble
Alcohol	Soluble
Ether	Soluble
Paraffin hydrocarbons	Soluble

*—Literature values for pure Tri-n-butylamine

In a number of applications Tri-n-butylamine serves as a corrosion inhibitor, usually in the form of one of its salts. Frequently the amine is simply added in a pre-determined proportion and allowed to combine *in situ* with all or part of the organic or inorganic acid present in the composition.

Tri-n-butylamine is also employed in the synthesis of dyestuffs and it is suggested as a raw material or an intermediate for the manufacture of textile assistants, pharmaceuticals, and petroleum additives. For example, small amounts of tributyl-ammonium salts of certain organic and inorganic acids may be added to lubricating oils to produce compositions having improved film strength characteristics (U. S. Pat. 2,228,325).

Sharples will welcome the opportunity not only to supply Tri-n-butylamine as such but also to cooperate with those who may prefer to purchase derivatives thereof which might be made in Sharples equipment.

SHARPLES TRADE MARK CHEMICALS

SHARPLES CHEMICALS INC.

PHILADELPHIA CHICAGO NEW YORK

S.O.C.M.A. Members Hold Spring Outing At Seaview Country Club, Absecon, N.J.

Sixty-five members and guests took part in the annual spring outing of the Synthetic Organic Chemical Manufacturers Association at Seaview Country Club, Absecon, N. J., June 5 and 6. V. E. Williams, of Monsanto, won the low gross golf tournament prize.

1

CI's roving photographer took the shots on this page. At the left is the clubhouse. Pictured here are:

(1) L. A. Koons, F. C. Scholler, Scholler Bros., Phila., and John T. O'Malley, Chief Magistrate, Phila. (2) T. A. Cassady, Wilmot Cassady, Inc. and W. H. Van Winkel, Carwin Co. (3) S. F. Urban, E. R. Squibb & Sons, and V. E. Williams, Monsanto. (4) E. J. Boehm, National Aniline and N. B. Conley, Calco. (5) W. T. Haebler, Van Ameringen Haebler, and J. H. R. Stephenson, Aromatic Products. (6) Charles P. Gulick and T. A. Printon, National Oil Products. (7) S. C. Moody, Calco. (8) Lyman S. Lloyd, Alex C. Fergusson Co. (9) S. Scott Althouse, Althouse Chemical Co. (10) G. L. Armour, American Aniline. (11) Bill Neuberg, William D. Neuberg Co. (12) H. Burrough, Monsanto, Merrimac Division. (13) W. F. Van Riper, duPont. (14) Col. W. S. Weeks, Calco. (15) Allen B. Clow, Advertising Mgr., Calco. (16) Dr. August Merz, president of SOCMA.

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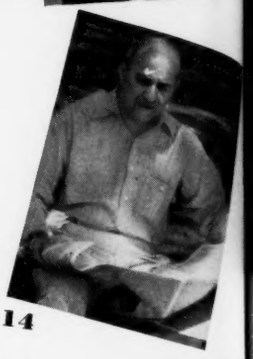

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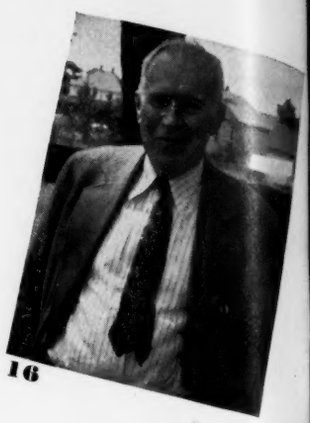

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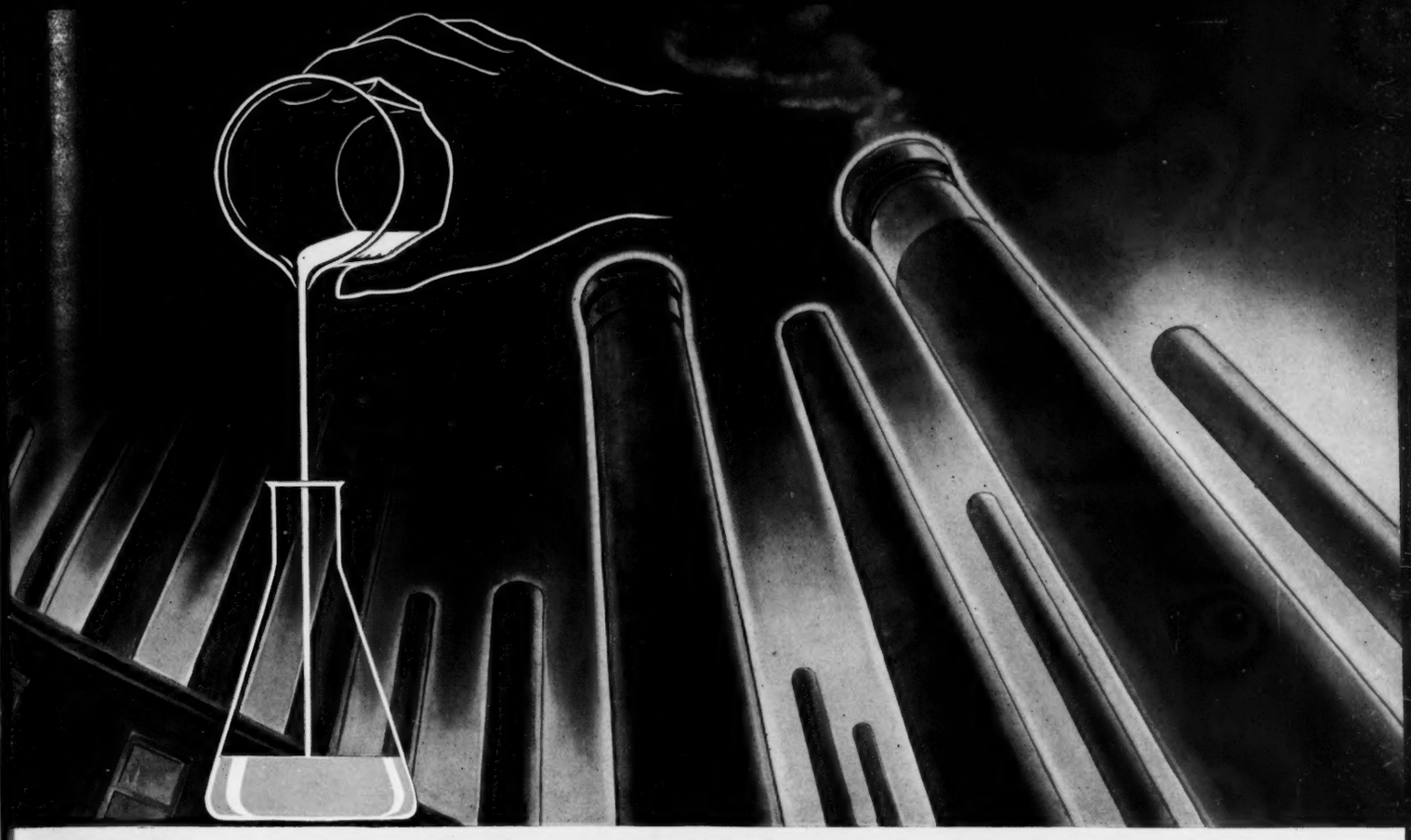


Baker OFFERS HIGH PURITY CHEMICALS —TONNAGE PRODUCING CAPACITY

. . . as war brings many new problems to former peace-time chemists

Today—most chemists are really *two* chemists in *one.*

Peace-time chemists are engaged in new fields, confronted with new problems.

Theirs is emergency work—and their need for tonnage chemicals of exacting specifications is more urgent than ever. More than that, these chemists want to be sure that such chemicals are readily available at all times.

It has been the privilege of the J. T. Baker Chemical Co.—in peace-time and now in war-time —to supply industry with tonnage chemicals of unusual purity.

We invite you to call upon Baker . . . and to rely upon Baker as a reliable source of supply. It may be that, in certain industries, some companies now making their own tonnage chemicals would like to free their plants of marginal operation.

Baker will gladly contribute the combined knowledge of its Technical, Executive and Manufacturing staffs to meet any war-time problem.

J. T. Baker Chemical Co. ***Executive Offices and Plant:*** **Phillipsburg, N.J.** ***Branch Offices:*** **New York, Philadelphia and Chicago.**

Baker's

INDUSTRIAL CHEMICALS

CAUSTIC SODA

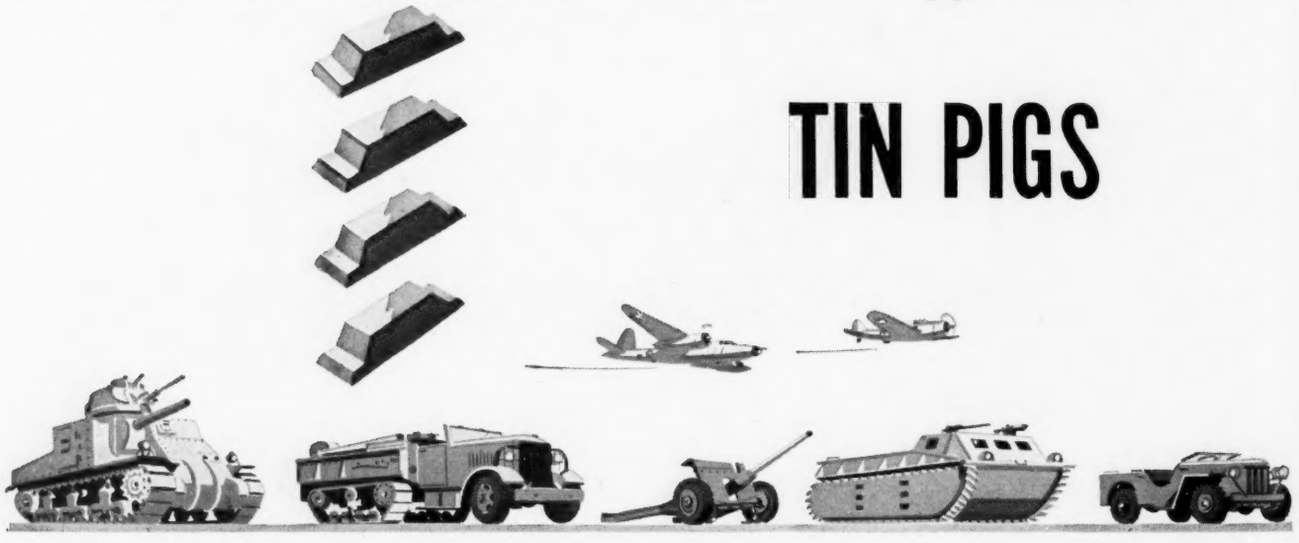
THE UNIVERSALLY USEFUL CHEMICAL

FROM

TIN CANS

TO

TIN PIGS



RENEWED INTEREST in the detinning of used cans is due directly to the war. Heretofore, the operation was considered impractical. With metal sources restricted, it now becomes an industry of vital importance.

Caustic Soda is an indispensable chemical for the removal of the critical tin from sheet steel. This universally useful chemical, in solution, dissolves the vital tin from the base metal.

Tin oxide, which is precipitated during the process, is dried and reduced and then cast into tin pigs which are sent to vital war industries using this metal.

Dow Caustic Soda is being supplied to this industry—and more than 35 others—from strategically located shipping points. Uniformity and consistently high quality, plus short freight hauls, make Dow a preferred source. Inquiries are invited.

DOW

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New York City • St. Louis • Chicago • San Francisco • Los Angeles • Seattle • Houston

NEWS OF THE MONTH

GOVERNMENT

WPB Realigned

A realignment of the War Production Board, designed to tie the economic and military strategies more closely together and to make more effective the Board's determinations of policies and programs governing the flow of materials, was announced this month by Chairman Donald M. Nelson.

The realignment does these things:

(1) It clears the decks to make controlling and expediting the flow of materials the Board's central effort.

(2) It brings the Board into closer touch with military and international production requirements, and increases the Board's activities in overall war production strategy.

(3) It strengthens the topside policy, programming and progress-reporting organization of WPB.

(4) It concentrates the operating portions of WPB under one head, and puts increased emphasis on the work of industry and commodity branches.

(5) It lightens the administrative load upon the Chairman so that he can devote his time to essential policy decisions and to the increasingly important relations of WPB with the other war agencies.

Two vice-chairmen are provided for in the new set-up. One will be William L. Batt, who will serve, in substance, as Mr. Nelson's general assistant and deputy. The other will be James S. Knowlson, formerly Director of Industry Operations. Mr. Knowlson will have responsibility for program determinations; he will serve as Mr. Nelson's Deputy on the Combined Production and Resources Board, and will be chairman of the Requirements Committee.

Twenty-One Indicted

Twenty-one acid-producing chemical companies were indicted last month on charges of violating the anti-trust laws along with dozens of company officials. The indictments, six in number, alleged illegal price-fixing and control of production and distribution.

The charges were voted by a Federal grand jury at South Bend, Ind., and named in four of the cases E. I. du Pont de Nemours and Co., Wilmington, Del., and General Chemical Co., and Mutual Chemical Co. of America, both of New York.

Charges in at least one case were placed against Standard Oil Co. of New Jersey; Dow Chemical Co., Midland, Mich.; Atlas Powder Co., Wilmington; Monsanto Chemical Co., St. Louis; Victor Chemical Works, Chicago; American Cyanamid & Chemical Corp., New York; the Harshaw Chemical Co., Cleveland; the Martin Dennis Co., Newark; Innis Speiden & Co.; Oldbury Electro Chemical Co., New York; Prior Chemical Corp., New York; Natural Products Refining Co., Jersey City; Davison Chemical Co.. Baltimore; Pennsylvania Salt Manufacturing Co., Philadelphia; Southern Agricultural Chemical Corp., New York; F. S. Royster Guano Co., Norfolk, Va.; Stauffer Chemical Co., New York, and the New Jersey Zinc Sales Co., New York.

Each indictment dealt with a separate product. These included sulfuric acid, a case in which 15 of the corporate defendants were named; bichromates of soda and potash; oxalic acid, muriatic acid, formic acid and chromic acid.

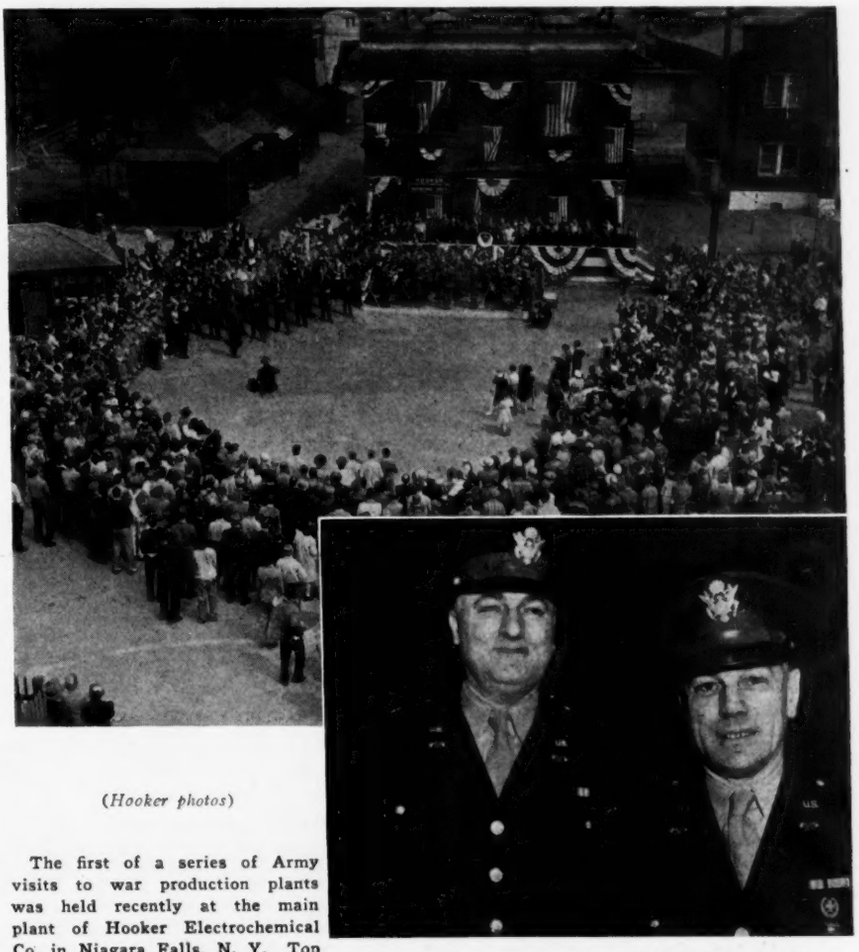
Signal Corps Library Wants Technical Books

A Signal Corps Reference Library has been established in Washington by Major General Dawson Olmstead, Chief Signal Officer of the Army.

Nationally known engineering societies have pledged their cooperation in making available books and periodicals that would be difficult to obtain through commercial outlets. The field of interest covers electronics, radio, telephone, telegraph, engineering, electricity, meteorology, physics, chemistry, electron microphotography, photography (still and motion), cryptology, signal communication, pigeon breeding and training, direction finding equipment and many other technical subjects.

Technical books and pamphlets on the above named subjects may be shipped directly to the Signal Corps Reference

Army Visits Hooker Plant in Niagara Falls



(Hooker photos)

The first of a series of Army visits to war production plants was held recently at the main plant of Hooker Electrochemical Co. in Niagara Falls, N. Y. Top photo shows General Paul X. English, Chief of Industrial Service, CWS, receiving the General's salute from U. S. Army troops and chemical workers at the ceremonies. In the inset are General Paul X. English (left) and Col. Harry A. Kuhn, Chief of the New York Procurement District. "Work of you chemical plant operators," General English told the assembly, "is just as necessary as the work of the man behind the gun."

Library, Office of the Chief Signal Officer, War Department, Washington, D. C. Contributors should make use of the special bookmailing rate of one and one-half cents per pound, not to exceed seventy pounds in one package.

Safety First

As a further step in the Bureau of Mines' war program of controlling non-military explosives and their ingredients to prevent sabotage, Dr. R. R. Sayers, Director of the Bureau, announced recently that a corps of investigators had been chosen to aid in administration of the Federal Explosives Act and regulations and also to investigate disasters and accidents involving explosives, the work being done in the Explosives Control Division of the Health and Safety Branch.

Metallurgists Wanted

The government wants metallurgists and chemists. It is expected that more than 100 metallurgists will be needed during the coming year in the Bureau of Mines, and there is a constant need for chemists in various branches of the government.

Requirements have been modified and there is no maximum age limit. There is an excellent opportunity for women chemists.

No deadline is set for applying for these positions, but persons who are available and qualified are urged to apply at once. The announcement with the application forms may be obtained at any first- or second-class post office or from the U. S. Civil Service Commission, Washington, D. C. Applications should be filed with the Commission's Washington office.

Academy Reports

The results of 18 months' operation of the National Academy of Sciences' Metals and Minerals Advisory Committee and work of the new War Metallurgy Committee have been announced. The Metals and Minerals Advisory Committee for the past 18 months has furnished OPM and WPB with 113 reports. Fifty-three of these were on metals substitution and conservation; 47 on ferrous minerals and ferroalloys; 4 on tin smelting and reclamation, and 9 on non-metallic minerals.

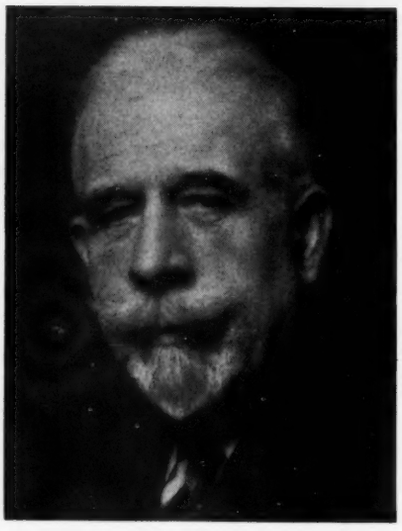
COMPANIES

Agfa-Ansco Centennial

A three-part program celebrating the great photographic achievements of the 100 years since the founding by Edward Anthony of the firm which is now Agfa Ansco will be held at the Waldorf-Astoria, N. Y. City, July 23. Members of the photographic industry are to be guests at the ceremonies and dinner.

First announcement and demonstration of two important advances in the study of the light ray and its utilization for mankind will be made.

To Get Society Medal



Dr. Harrison E. Howe of Washington, D. C., editor of "Industrial and Engineering Chemistry", publication of the American Chemical Society, has been awarded the 1942 Chemical Industry Medal of the Society of Chemical Industry which is given annually since 1920 to "a person making a valuable application of chemical research to industry".

Dr. Howe will receive the award and deliver an acceptance address at a joint meeting of the American Section of the Society of Chemical Industry and the New York Section of the American Chemical Society in New York City Nov. 6.

Westvaco Integrates Divisions

Production, technical and sales operations of Warner Chemical Co. division, California Chemical Co. division, Magnesol Co. division, and National Kellastone Co. divisions of the parent company were integrated into Westvaco Chlorine Products Corp., N. Y. City, July 1.

The streamlining, company explains, was made to simplify and coordinate internal operating procedures, to consolidate technical and sales operations, thereby rendering better service to government and industry.

For the convenience of chemical buyers, Westvaco Chlorine Products Corp., N. Y. City, has issued, on a handy letter-size card, a summary of WPB Allocation Classification Order Numbers.

On the face side is a summary of the instructions issued by WPB on the Allocation Order Number system to be used on all purchase orders dated June 30, 1942 and thereafter. On the reverse side is a tabulation of the order numbers and classifications covering every branch of military and civilian goods.

Copies of this desk-card may be obtained without charge from the company.

"Merck Report" Gets Award

The patriotic service cross of the U. S. Flag Association has been awarded to the "Merck Report" for the best flag cover design among house magazines. The winning cover on the July issue showed an original painting of the flag in full color against a photographic background which included the symbols of science and industry.

Add Chemical Division

Corneliussen & Stakgold, Inc., N. Y. City, announces the addition of a new chemical division to its sales organization, which will act as exclusive sales representative for American manufacturers of industrial and fine chemicals and pharmaceuticals. F. N. Howard, formerly of Livingston & Southard, Inc. and General Chemical Co., has been appointed manager of the new division.

Workers Support Marshall

Photographic & Chemical Workers Union No. 22615, Affiliated with A. F. L., offered its unstinting support last month to Albert E. Marshall, executive in charge of Agfa-Ansco, symbolizing "the unity of management and labor in the war effort."

The union, in a written welcome, pledged that "(1) We shall submit all differences which cannot be adjusted through negotiation to peaceful arbitration. (2) For the duration of the emergency, we repudiate the right to strike. (3) Your efforts to transform Agfa-Ansco into a real war industry will have our support to the last ounce of our energy."

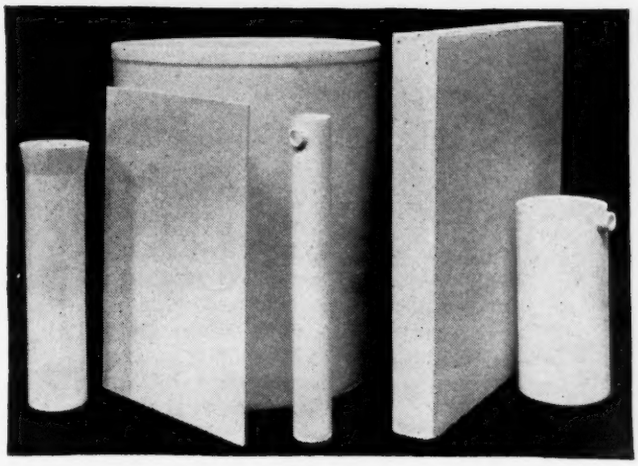
The Agfa-Ansco organization is a division of General Aniline & Film Corp., which now has a new management of American engineers and industrialists. The company's facilities are now devoted to handling Army and Navy contracts.

GPI Pools Division

As a result of the many demands for industrial finishes and other protective coatings made upon the individual divisions of General Printing Ink Corp. by the war program, it has been decided to pool the facilities of the entire Corpora-

CERAPHRAGMS

Domestic Porcelain-Like Electrolytic Diaphragms



No need to worry about the shortage of electrolytic porcelain diaphragms from Europe. The new CERAPHRAGMS, made in the U. S. A., offer low electrical resistance and high mechanical strength comparable with Europe's best . . . . *and are available.*

Leading users in this country specified their exacting needs. These requirements and the results of our research and development are embodied in CERAPHRAGMS—the new porcelain-like porous diaphragms for electrolysis.

ESSENTIAL FEATURES OF CERAPHRAGMS

High Mechanical Strength

Due to the high firing temperature.

Uniform Structure

Uniform particle size and orientation of pores over the entire area is secured by systematic control during manufacture. Electrical resistance may thus be considered as directly proportional and permeability and rate of diffusion inversely proportional to the wall thickness.

Purity of Constituents

Careful selection and processing of raw materials insure the same resistance to active chemical products that characterizes the porcelain and glass used in the laboratory. There is no trace of metallic salts that might induce catalytic action.

CERAPHRAGMS can be produced as plates, cylinders, rectangular tanks or almost any desired shape.
Inquiries for diaphragms having special characteristics are invited.

GENERAL CERAMICS COMPANY
CHEMICAL STONEWARE

GENERAL CERAMICS COMPANY
KEASBEY, NEW JERSEY

NEW YORK, 30 Broad Street; BUFFALO, 306 Jackson Building; SAN FRANCISCO, 598 Monadnock Building; CHICAGO, 208 South LaSalle Street; SEATTLE, 1411 Fourth Avenue Building; LOS ANGELES, 415 South Central Avenue; SPOKANE, 1823 South Maple Street; PORTLAND, Railway Exchange Building; TACOMA, Tacoma Building; MONTREAL Canada Cement Building; TORONTO, Richardson Agencies, Ltd., 454 King Street, West.

2839

tion into one division, General Industrial Finishes.

John F. Devine, vice-president of the corporation and general manager of the Fuchs & Lang Manufacturing Co. Division, will also act as general manager of the new division. Walter A. McKim, previously director of industrial research for Pittsburgh Plate Glass, will be assistant general manager.

Chamberlain Expands

Chamberlain Engineering, Ltd., a unit of the U. S. Stoneware Co. recently purchased the business and mechanical rubber goods factory of the Lower Rubber Mfg. Co. at Ravenna, O.

New plant will be used principally for milling, calendering, extruding and molding operations on the "Tygon" series of synthetic rubber-like materials. Provision will also be made for the production of U. S. Stoneware's "Duralon".

Technical facilities and sales organizations of the two companies will be merged.

War Gases Described

"Warfare Chemical Hazards," an informal lecture given by L. L. Hedgepeth, manager of technical service for Pennsylvania Salt Manufacturing Co., before air raid wardens in Delaware County, Pa., has been reprinted by the company and is offered in limited supply to interested persons.

Farastan Co. Moves

The Farastan Co. has moved from 135 South 11th St. to 1619 Chestnut St., Philadelphia, Pa. Telephone number is Rittenhouse 7991.

Hercules Office Moves

Detroit office of Hercules Powder Co. has been moved to enlarged quarters in the Fisher Building. Office now includes the Cellulose Products Department, the Naval Stores Department, the Synthetics Department, and the Paper Makers Chemical Department.

Great Lakes Carbon Moves

Great Lakes Carbon Corp. has moved its Chicago office to 333 N. Michigan Ave.

Keystone Expanding

Keystone Carbon Co., St. Marys, Pa., is now completing a large program of expansion including plant and production facilities.

Inco Fellowship

International Nickel Co., Inc., N. Y. City, has resumed investigational work at Mellon Institute of Industrial Research, Pittsburgh, Pa., by the establishment of an Industrial Fellowship that began operation on July 1. Dr. John Dean, a physico-organic chemist, is the incumbent of this fellowship.

ASSOCIATIONS

Paint Club News

Ernest T. Trigg, President of the National Paint, Varnish & Lacquer Association was honored June 30 by the paint industry with a dinner at the Union League, Philadelphia, in celebration of his fifty years of service to the industry.

Three hundred and fifty of the leading paint manufacturers from all parts of the Country and Canada as well as prominent civic and industrial leaders representing practically every line of endeavor attended.

The dinner was sponsored by the Philadelphia Paint, Varnish & Lacquer Association, and Samuel R. Matlack, President of George D. Wetherill & Co., Inc. acted as Honorary Chairman.

Annual meeting of the Cleveland Paint, Varnish and Lacquer Association was held May 29, at Acacia Country Club, Cleveland. President, Frank C. Wrede, Benjamin Moore & Co.; vice-president, Walter T. Clark, Patterson-Sargent Co.; secretary, Allyn K. Thayer, C. K. Williams & Co.; treasurer, Andrew A. Mazeika, Pittsburgh Plate Glass Co.

Southern States Federation Associates has changed its name to Southern Paint and Varnish Production Club.

Spring advisory meeting of the Southern Paint & Varnish Production Club was held in Atlanta, May 30.

To aid in the evaluation of luminescent materials, an exhibit has been prepared and is now being shown at the headquarters of the National Paint, Varnish and Lacquer Association, 1500 Rhode Island Avenue, N. W., Washington, D. C. This exhibit is the joint work of Subcommittee No. 43 of the New York Paint and Varnish Production Club and Dr. Henry A. Gardner of the National Paint, Varnish and Lacquer Association.

One hundred members and guests were present at the Annual Past Presidents' Night of the Chicago Paint & Varnish Production Club, in the Jungle Room of the Fred Harvey Restaurant, Union Station.

Forty-seven members and guests attended the May meeting of the Golden Gate Paint & Varnish Production Club at the City Club Hotel, Oakland.

Dr. Knauss of Reichhold Chemicals, Inc. gave a talk on the present specifications for protective coatings for the Army and Navy. He discussed the more important ones in the various Corps, and then told what was being done to simplify and correlate them.

The 222nd meeting of the C D I C Production Club was held June 8, at the Columbus Country Club, Columbus. Forty-nine golfers played in the annual tournament.

With Commercial Solvents

Dr. Paul W. Bachman has been appointed Assistant Research Director of Commercial Solvents Corp., Terre Haute, Ind. He came to his present position from the General Chemical Company where he was Manager of Research and Technical Supervisor of Phosphates.

SCI Elects Officers

The American Section of the Society of Chemical Industry announces the election of the following officers for the year 1942-1943. Chairman, Dr. Foster D. Snell; vice chairman, Dr. Norman A. Shepard; honorary secretary, Cyril S. Kimball; honorary treasurer, J. W. H. Randall.

The following new committee members were elected to take the place of retiring members. Edward R. Allen, Francis J. Curtis, Dr. Donald Price, Archie J. Weith, Dr. Lincoln T. Work.

Salesmen To Golf

Third golf tournament of the season for the Salesmen's Association of the American Chemical Industry will be held August 11 at Hackensack Golf Club, Oradell, N. J.

Textile Convention Out

Annual meeting of the American Association of Textile Chemists & Colorists scheduled to be held in Atlantic City Oct. 8 to 11 has been cancelled in keeping with the government's policy to eliminate all conventions which involve extensive travelling on the part of the delegates.

Juniors Elect Officers

Junior Chemical Engineers of N. Y. City recently elected the following officers for the ensuing year:

President: John R. Callahan, "Chem & Met"; Vice-President: Howard Ten Broeck, Socony Vacuum Oil Co.; Secretary-Treasurer: Albert Ackoff, Westvaco Chlorine Products Corp.; Ass't Secretary-Treasurer: Alvin S. Weiss, Schenley Distillers Corp.

TAPPI To Boston

Fall meeting of the Technical Association of the Pulp & Paper Industry will be held at the Statler Hotel, Boston, Sept. 29-30, October 1, 1942.

PERSONNEL

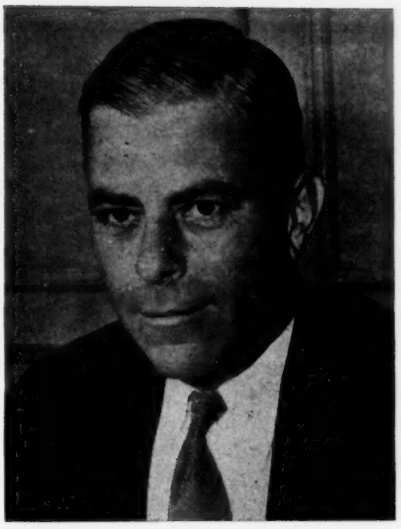
Eugene D. Gardner, supervising engineer of the Southwest experiment station of the Bureau of Mines at Tucson, Ariz., since 1925, has been appointed regional director in charge of the newly-organized Central States office at Rolla, Mo., which is to expedite the exploration and development of strategic war minerals . . . **Stuart R. Zimmerley,** expert in ore-dressing methods for minerals, has been appointed regional engineer of the newly-created regional office at Salt Lake City, Utah . . . **John J. Forbes, William J. Fene** and **Simon H. Ash** are three veteran mining men who have been appointed to head the Bureau's emergency wartime Mineral Production Security Division . . . **Stephen M. Shelton,** Bureau of Mines metallurgist and an authority on the recovery and processing of manganese and other domestic ores, has been appointed regional engineer for the Eastern and Southern States with headquarters at College Park, Md.

Ralph L. Evans Associates, research division of Evans Chemetics, Inc., has added to its staff of chemists the following:

Dr. S. A. Bell, Clifford H. Bundy, Philip Heiberger, Dr. John S. McCoy, Dr. John F. Mulvaney, Florence M. Thein.

Carl S. Miner of the Miner Laboratories, was initiated by Alpha Chi Sigma, professional chemical fraternity, into its Illinois Institute of Technology chapter during the Seventeenth Biennial Conclave held in Chicago, June 19-22.

Charles A. Mace, secretary of the Synthetic Organic Chemical Manufacturers Association, has been elected president of the Wool Club succeeding



Thomas J. Knapp, former traffic manager and assistant sales manager of the Freeport Sulphur Co., has been elected assistant vice-president by the board of directors.

John P. Abbott of the Providence Dyeing, Bleaching and Calendering Co.

S. B. Penick, Jr., executive vice-president of S. B. Penick & Co., was made president of the company last month. **S. B. Penick,** former president and founder of the company, was elected to the new office of chairman of the board,

Herman K. Eckert, plant manager of the Nitro, W. Va., plant of the Organic Chemicals Division of Monsanto, has been appointed plant manager of the Texas City plant . . . **Dr. Charles S. Comstock** of the production staff of the Merrimac Division at Everett, Mass., has been appointed production superintendent.

Harry M. Ellsworth, advertising manager of Pennsylvania Salt Manufacturing Co., has been elected vice-president of the Eastern Industrial Advertisers Association for the 1942-43 term.

A. L. Diederich, Jr., formerly of Barrett, has been appointed assistant to the president, J. E. Lonergan Co., Philadelphia.

J. P. Margeson, Jr. and **Franklin Farley** were elected vice-presidents of International Minerals & Chemical Corp. last month.

John G. Beach has been named a research engineer on the technical staff of Battelle Memorial Institute, Colum-

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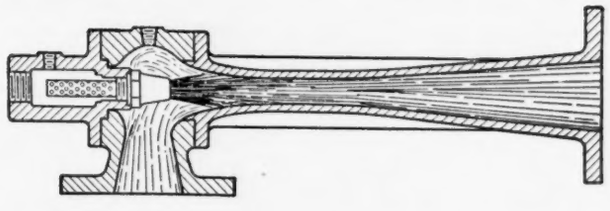
KEEP 'EM FLOWING!



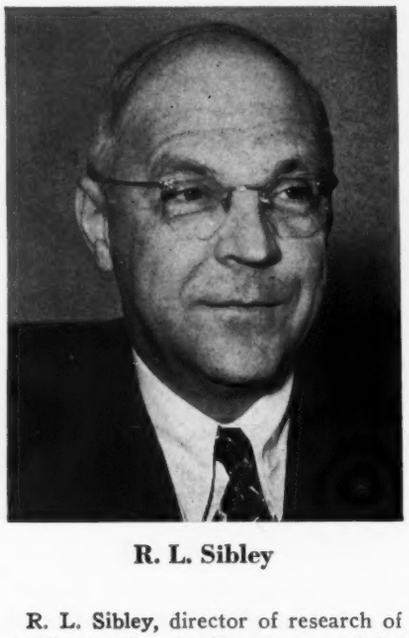
We refer to the vapors being removed from thousands of Condensers and Processing Vessels by Croll-Reynolds Steam Jet Evactors. Production Equipment for this apparatus is being pushed to keep up with what seems to be an ever-increasing demand. Now, even more than ever, we are eager to help the operators of the many thousands of Croll-Reynolds Evactors get the maximum performance from existing equipment.

In some cases vacuum can be increased by merely changing the nozzles. Capacity can often be increased by changing the nozzles and throats or by re-machining them. It is our policy to keep in stock rough castings for throats and suitable materials for nozzles which can be promptly machined for individual conditions on prevailing priorities. Complete new Evactors for vacuum to a small fraction of 1 mm. are still being made subject to crowded conditions on ordnance equipment.

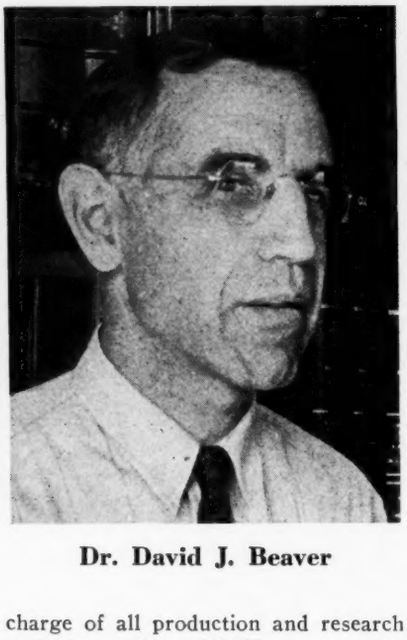
CROLL-REYNOLDS CO.

17 John Street **New York, N. Y.**

Monsanto Makes Some Promotions



R. L. Sibley



Dr. David J. Beaver

Harry A. Merkle

R. L. Sibley, director of research of the Rubber Service Department of the Organic Chemicals Division of Monsanto Chemical Co. has been made general manager of manufacturing in charge of all production and research activities at Nitro, W. Va.

Dr. David J. Beaver has been appointed research director of the Rubber Service Department, and **Harry A. Merkle,** production superintendent of the Nitro plant, plant manager succeeding **Herman K. Eckert,** who has been named plant manager of the synthetic rubber chemicals plant.

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bus, O., where he has been assigned to the division of electrochemistry.

Gardner H. Chidester, for the past 16 years closely associated with sulfite and semichemical pulping process investigations as a member of the U. S. Forest Products Laboratory's Division of Pulp and Paper, has been appointed chief of that division.

R. B. McKinney has been made assistant general manager, Paper Makers Chemical Department, of Hercules Powder Co.

Henry M. Minton, vice-president of Church & Dwight Co., Inc., has been commissioned a Captain in the U. S. Army Air Corps and is now on active duty "somewhere in the U.S.A."

Robert T. Kain, sales engineer in the belting department Industrial Products sales division of B. F. Goodrich Co. has resigned to enter the service of the United States Navy as a lieutenant, junior grade.

L. H. "Larry" Chenoweth, Manager Manufacturers' Sales, in the Industrial Products Sales Division of B. F. Goodrich Co. has been granted a leave of absence to serve on the Rubber Products Division of the WPB.

George Omohundro, formerly of the Barrett Division, Allied Chemical & Dye Corp., has been made manager of the plant for Eastern Tar Products Corp., Norfolk, Va.

William R. House, former assistant sales manager of the Pharmaceutical and Proprietary Container Division, Owens-Illinois Glass Co., has been made acting branch manager of the Buffalo, N. Y., branch during the illness of **George W. Zingerle. William W. Robertson** will assume House's former position.

Dr. Thomas Midgley, Jr., internationally known for his discovery of tetraethyl lead, has been elected an honorary member of the National Academy of Sciences. Dr. Midgley is chairman of the Board of Directors of the American Chemical Society and vice-president of the Ethyl Corp.

Dr. Oliver Bowles, geologist, mining engineer and internationally-known authority on non-metallic minerals, has been made chief of the Non-metal Economics Division of the Bueau of Mines.

Charles T. Lipscomb, Jr. has been elected a vice-president of McKesson & Robbins, Inc., succeeding **Charles Hermann** who has resigned. He is attached to the administrative offices in N. Y. City in direct charge of the chemical division . . . **George W. Cobb, Jr.,** Director of Advertising for American Can Co., has been commissioned a major in the Quartermaster Corps of the U. S. Army and has been assigned to immediate field service.

Charles Hermann, a vice-president of McKesson-Robbins, Inc., will join R. J. Prentiss & Company, N. Y. City, as vice-president in charge of Chemical, Gum and Allied Products on August 1, 1942. This new division will operate in addition to the firm's botanical and insecticide divisions now under the direction of **Richard J. Prentiss,** president, and **Harold King,** vice-president.

Charles Schneider, promotion editor of the Cleveland Press and director of its Public Service Bureau for the past six years, has been appointed advertising director of the Arco Co., Cleveland.

George W. Schwarz, controller of the Michigan Alkali Co., has been elected president of the Detroit Control of the Controllers Institute of America . . . **Daniel M. Sheehan,** controller of the Monsanto Chemical Co., has been elected president of the St. Louis Control of the Controllers Institute of America . . .**John S. Learoyd, Jr.,** controller of the Hygrade Sylvania Corp., has been elected president of the New England Control of the Controllers Institute of America . . . **E. F. Campbell,** controller of The Fry-Fryter Company, has been re-elected president of the Dayton Control of the Controllers Institute of America.

Dr. V. E. Wellman, with B. F. Goodrich Co. since 1929, has been appointed manager of the company's newly-organized chemical and pigments department of the purchasing division.

James V. O'Leary, central division manager for Commercial Solvents, reported recently for active duty as an officer in the Chemical Warfare Serv-

(*Continued on page 104*)

CHEMICAL SPECIALTY COMPANY NEWS

Brush Campaign Popular

AN illustration of the public support being given the national brush conservation campaign was provided June 17 at Princeton, Ind., when people from a number of surrounding communities in the tri-state area turned out to celebrate the premiere of the campaign. The program is being sponsored by Devoe & Raynolds Co., Inc., as a contribution to the war effort.

Mayor T. C. Fowler of Princeton made a brief address of welcome to the people and to Devoe & Raynolds who have recently moved their brush manufacturing activities to Princeton. He introduced F. E. Richards, superintendent of the brush factory. A. H. Mohrhusen, manager of the brush division of the company, made the principal address which was patriotic in tone.

Paint in Paper "Cans"

Paper paint cans are the latest contribution of The Sherwin-Williams Co., manufacturer of paints and varnishes, to the war conservation drive. The top and bottom of the new container, which is the result of several months of experimentation at the company's Chicago Plant, are

metal discs, but the body is made entirely of cardboard impregnated with an insoluble substance.

No tin at all is required. In fact, according to H. J. Hain, Vice-President who was in charge of the project to develop a "war emergency container", Sherwin-Williams restricted the use of tin plate several years ago when engineers at its Chicago Can Plant found that alloy coated plate made just as good paint cans as tin plate.

This alloy coated plate is now being used for the metal ends of the new container, but further experiments are already underway which, it is hoped, will result in the complete elimination of alloy plate and permit the metal discs to be made from lacquered black plate.

The biggest problem in developing the paper can was finding a method of moisture-proofing the cardboard. The common ice cream container could not be used because it would soak up the oils and solvents in paint, resulting in a soggy can and deteriorated contents. This obstacle was overcome by chemically treating the cardboard and placing an impregnated paper lining inside the can to prevent "wicking" or absorption.

According to Mr. Hain, the company does not claim that the new substitute is just as good as an all-metal container. A new label carries the line—"War Emergency Container — Handle with Care". However, the paper can has been tested extensively for wicking, for evaporation, and for shipping and storage qualities, and in each respect it has proved completely satisfactory.

Inside diameter of the new container, now in production in the quart size, is slightly less than the all-metal can because the walls are thicker. The height has been increased to allow for the change in diameter and for the generous "bite" with which the ends clamp the paper body. In addition to quarts, a half-pint and a gallon size will also be manufactured.

Another metal conservation measure recently introduced by Sherwin-Williams is the placing of a billing charge to the customer on large metal drums and a refund when returned to insure their quick return when empty. When returned, the drums are scoured with a caustic solution, spray-finished, and put back into use. This process can be repeated over and over again.

As a result of these and other conservation measures, Sherwin-Williams will now be able to get along with less than half as much metal plate as it used for containers in 1940. The remainder will be released for war production.

Urges Long Range Research

Urging American industry to continue long range research projects if at all possible, Dr. Donald Price, newly-elected vice president of the American Institute of Chemists, maintained that such policies will contribute much to the war effort, in addition to providing products and processes which will "carry" industry after the war.

Dr. Price, who is technical director of National Oil Products Co., speaking at the Twentieth Annual meeting of the American Institute of Chemists on "The Chemist in Today's Industry," contended it would be "highly unwise to abandon all long range research, even under the stress of war."

Higgins Ink Co. recently changed its packaging of ¾-oz. drawing inks from a dozen units in display container to these machine-wrapped packages of six.

ice. During his absence the supervision of the Central and Eastern Divisions will be consolidated under **H. B. Sliger,** present eastern division manager in New York.

Samuel A. Woodruff has been named a research engineer on the technical staff of Battelle Memorial Institute, Columbus, O., and has been assigned to the division of organic chemistry.

J. P. Madden of Stauffer Chemical Company's Philadelphia Office has been transferred to the New York office where he will handle the sales of industrial chemicals.

Rebecca Shapiro has resigned her position with the N. Y. City Department of Health to become head of the Bacteriological Department of Foster D. Snell, Inc. **Dr. S. S. Epstein** who previously headed up that work becomes vice-president of Kirsch's Beverages, Inc., but will serve in a consulting and advisory capacity.

Louis Johnson, former assistant secretary of war, has been named to head General Dyestuff Corp. sales agency for General Aniline & Film Corp.

Herman K. Eckert has been appointed to take charge of Monsanto's new plant at Texas City, Tex., for the manufacture of a synthetic rubber chemical.

George Uhe, head of the chemical brokerage and agency bearing his name, reported recently for duty with the U. S. Army sanitary corps as a first lieutenant.

J. P. Margeson Jr. and **Franklin Farley** were elected vice-presidents of International Minerals & Chemical Corp. last month at a regular meeting of the board of directors.

Robert J. Milano, general manager, Millmaster Chemical Co., reported last month for training as an officer in the U. S. Army . . . **Robert G. Wilson,** associated with Dow for the last 17 years, reported for duty with the U. S. Navy, July 1.

Dr. Raymond C. Bender, formerly with Harris Laboratories, Inc., has been appointed nutritionist in charge of the bio-assay laboratories of Food Research Laboratories, Inc., L. I. City.

PACKAGING & CONTAINERS

(*Continued from page 80*)

M-158, announced recently by the Director of Industry Operations.

This order is expected to save nearly a million pounds a year of critical oils and resins, which are needed for military purposes. Normally, about 1,600,000 pounds each of critical oils and resins are used for drum coating each year.

The order divides coatings into two classes: "Class A," and others. Class A coatings, containing tung, oiticica, perilla or dehydrated castor oils; alkyd, phenolic, vinyl, urea, or melamine resins; or cellulose esters or ethers; may not be used for drum coating after June 20 except for export (other than Class A coatings containing tung or oiticica), or orders for the Army, Navy, Coast Guard or Maritime Commission.

The order further provides that after June 20 no person shall apply any coating other than black, except for small areas of color required for marking or legal requirements.

Users of container coatings are forbidden to accept, after June 7, delivery of any Class A coatings, or any colored coating (except black, grey and white) except for offshore shipment or export, or for the Army, Navy, Coast Guard or Maritime Commission.

The order was amended on June 29th to allow the use of any coatings made for exterior drum paint on or before June fifth. It also allows the use of any contrasting colors for one or both heads but the cylindrical shells must be painted black. Paints must not contain any of the class A coating materials listed above.

BETWEEN THE LINES

(*Continued from page 53*)

terms it will probably make conservation measures compulsory, so far as possible, and otherwise insure that the industries provide the solvents now going to waste.

As to the machinery for conversion of waste products, a survey of the whole field is stated to indicate that the industry has present available facilities for increasing by 50 to 75 per cent the amount of solvent reclamation now operative in the country.

"Salvage of dirty, contaminated solvents so that they can be used again in industrial processes and channeled into war production is a problem to which every commercial user of solvents and oils should pay attention," the Bureau states. "We cannot afford to waste precious chemical resources."

In line with the program indicated here, the WPB has acted in recent weeks to divert more than half of the two principal aromatic constituents of petroleum solvents—toluol and xylols—from use in protective coatings, to the more vital nitration toluol and aviation gasoline.

Normally used in paints and other protective coatings, deliveries have been restricted, and each producer of solvents must accumulate as soon after July 1 as possible, a minimum inventory of not less than 25 per cent of his average monthly production of each solvent produced during the first quarter of 1942, which reserve will be held as a pool from which distribution can be ordered by the Director of Industry Operations, WPB. Replenishment of the reserve must be made at a rate of 5 per cent of average daily production.

After making rated deliveries the restrictions of distribution of the remaining supply become operative, and no person is permitted to use the solvents named for any purpose if suitable substitutes can be utilized and are available.

This order, in this one field of solvent production, indicates the pressure on the war machine for solvents for every conceivable purpose, and the reason why recovery or reclamation is a vital part of the war effort.

WASHINGTON

(*Continued from page 10*)

Simplification of shades and odors in cosmetics is forecast in a WPB announcement, following a meeting of the Toiletries and Cosmetics Industry Advisory Committee.

Price actions at the Office of Price Administration included the following:

Maximum Price Regulation 171, establishing maximum prices for unwashed or washed film scrap, effective June 30; prices of anti-freeze for next winter stabilized in Maximum Price Regulation 170, effective June 30; wood and gum for naval stores excepted from General Maximum Price Regulation in Amendment 5 to this regulation; effective June 19;

Price ceilings removed as of June 13, on synthetic rubber, aviation gasoline, toluene, and materials essential to their manufacture, in amendments to Supplementary Regulation 1, of GMPR., and to Revised Price Schedule 88;

Fluorspar Processing Company, Colorado Springs, Col., allowed to sell its glass grade fluorspar at same maximums previously authorized for acid grade, in Order No. 1 under Maximum Price Regulation 126 (Fluorspar); applications of Distillation Products, Inc., Rochester, N. Y., and Grayslake Gelatine Co., Grayslake, Ill., setting maximums for these companies, granted by OPA; permission to sell refined wax slightly in excess of price maximums in Revised Price Schedule 42, granted Paragon Products Corporation, Oshkosh, Wis.; and Paragon Wax Refining, Inc., San Francisco, Calif.; E. R. Squibb & Sons, allowed to set a price for a new serum stated to be different from any previously sold by it or by competitors—Anti-Pertussis Serum, for whooping cough, in Order 11, GMPR.;

Purchases by the United States Government for immediate delivery of any commodity for which emergency need exists, are excluded from GMPR., through Amendment 5 to these regulations;

Chemical producers are permitted to build up inventories of coal and coke by amendment No. 2 to Preference Rating Order P-89, effective until revoked instead of to June 30, as originally stipulated.

THE DORR PROCESSING ASSISTANCE PLAN

To Help You Do More With What You Have

PRIORITIES, allocations of raw materials and all the other restrictions on war-time production have reduced our ability to serve some of our oldest and best customers. Perhaps, you are one of them.

"First things first" has necessarily characterized our war work—has favored the equipment needs of those companies which could harness this equipment to the production of the strategic essentials of modern warfare.

But we haven't forgotten our "non-war work" customers, whose patronage we received during the quarter century of peace between wars. Today they are striving manfully to get by as best they can with what little equipment they have.

Their lack of priorities prevents our building new equipment for them. But their lack of priorities does not prevent our sharing with them our "know how" and processing ideas. On this simple fact rests the Dorr Processing Assistance Plan, outlined at the right.

The Dorr Processing Assistance Plan is based on a sincere desire to help users of Dorr equipment whose equipment inventories seem to be frozen for the duration. We aim to serve them, if not with machines, then with ideas.

THE DORR PROCESSING ASSISTANCE PLAN

You—write us a complete statement of your processing problem—more capacity, higher quality, change of product, or whatever you desire.

We—check your problem from four angles—engineering, design, operation, and development—and recommend a solution, if it is possible to do so.

We will send an engineer to review your problem with you when such a trip is warranted.

You—obtain the best suggestions we can make from the vantage points of broad processing experience and familiarity with the scope and limitations of our own equipment.

DORR

RESEARCH ENGINEERING EQUIPMENT

ADDRESS ALL INQUIRIES TO OUR NEAREST OFFICE

DORRCO

THE DORR COMPANY, INC., ENGINEERS

NEW YORK, N. Y. . . . 570 LEXINGTON AVE.
ATLANTA, GA. . . . CANDLER BUILDING
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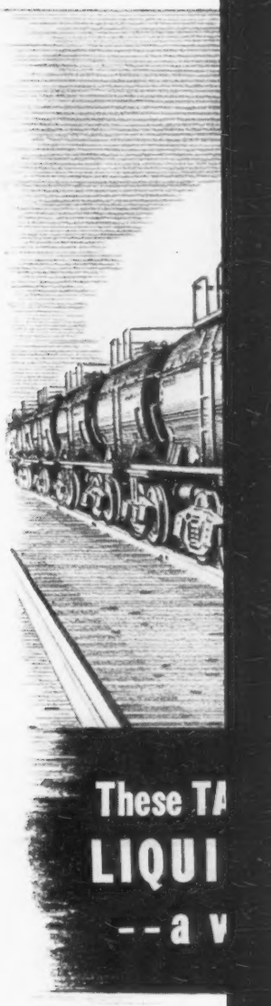
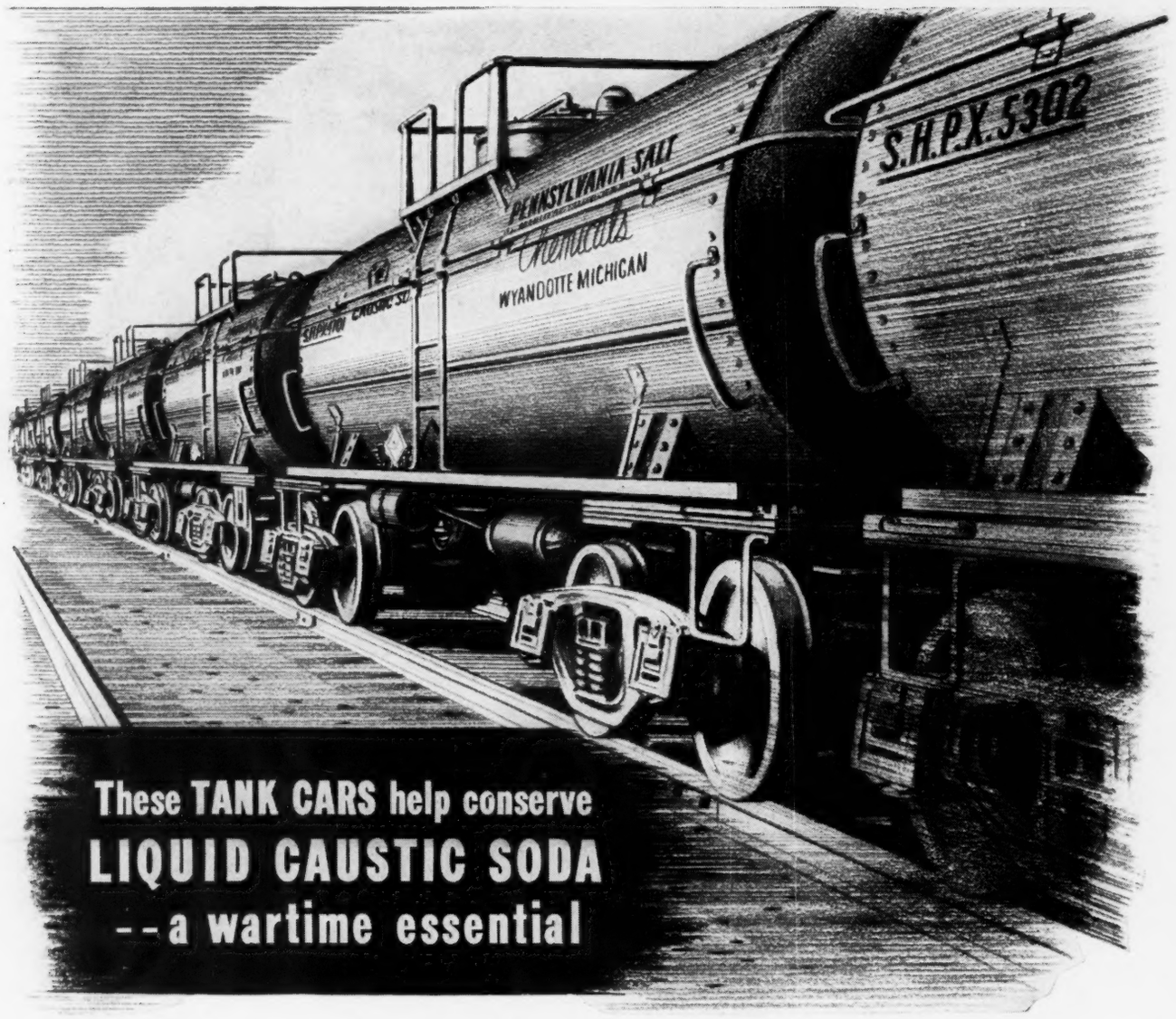
CHICAGO, ILL. . . . . 221 NO. LA SALLE ST.
DENVER, COLO. . . . . COOPER BUILDING
LOS ANGELES, CAL. . . . 811 WEST 7TH ST.

RESEARCH AND TESTING LABORATORIES
WESTPORT, CONN.

SUGAR PROCESSING
PETREE & DORR ENGINEERS, INC.
570 LEXINGTON AVE., NEW YORK





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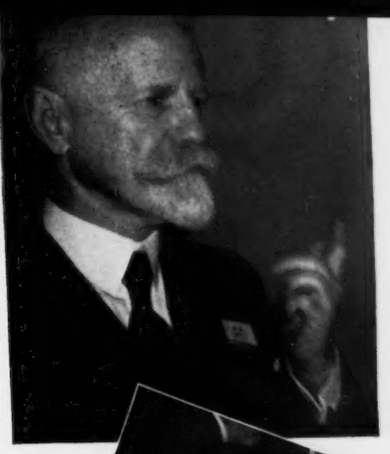
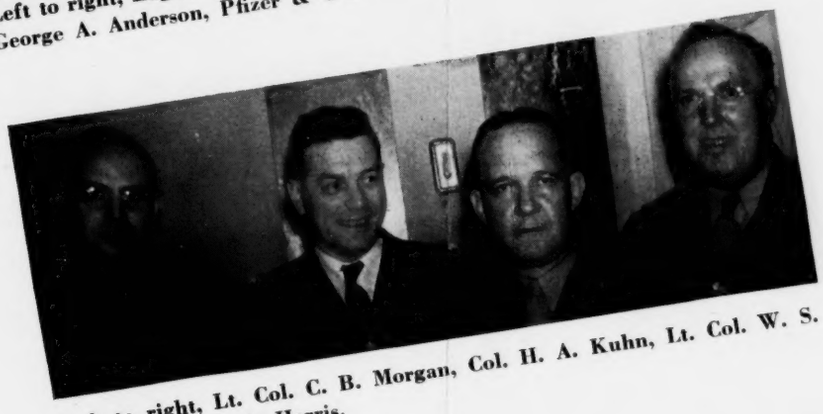
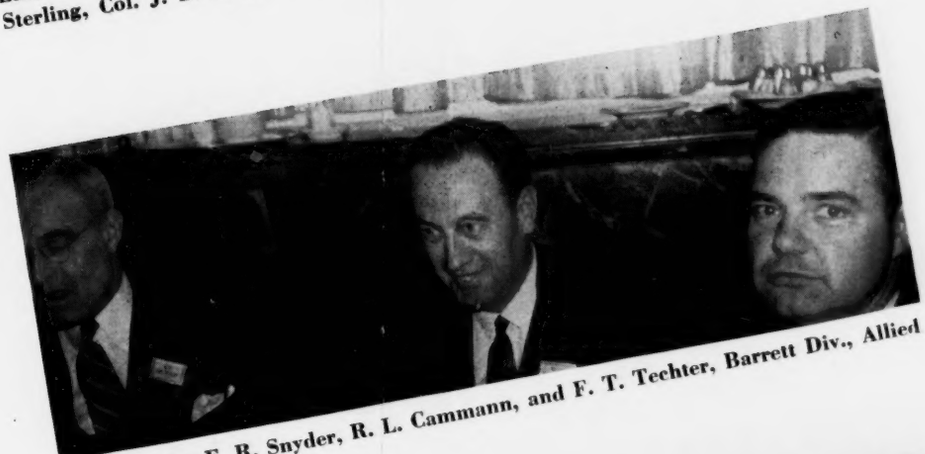
Left to right, Edgar Queeny, Monsanto; George W. Merck, Merck & Co.; and George A. Anderson, Pfizer & Co.

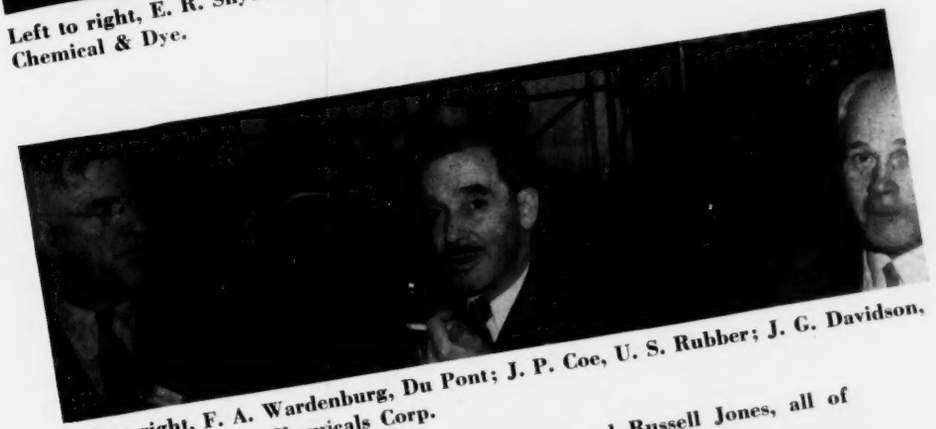




Left to right, Lt. Col. C. B. Morgan, Col. H. A. Kuhn, Lt. Col. W. S. Sterling, Col. J. B. Harris.



Left to right, E. R. Snyder, R. L. Cammann, and F. T. Techter, Barrett Div., Allied Chemical & Dye.



Left to right, F. A. Wardenburg, Du Pont; J. P. Coe, U. S. Rubber; J. G. Davidson, Carbide & Carbon Chemicals Corp.

Left to right, E. W. Clark, A. L. Loebenberg and Russell Jones, all of Barrett Div., Allied Chemical & Dye.

Manufacturing Chemists' Association

THE Manufacturing Chemists' Association abandoned its precedent of a three-day meeting at Skytop, Pa., this year because of the heavy responsibilities of chemical executives in the war program and held its 70th annual meeting to a one-day session at the Waldorf-Astoria, N. Y. City, June 4. It was the best-attended meeting on record.

Representatives of the army and the WPB were on hand to take part in discussions of problems relating to all-out chemical production for war.

With Lammot du Pont presiding at the business session, Dr. E. W. Reid, Chief of the Chemicals Branch, WPB, told of the operations of that division. Participating in an open forum discussion were Dr.

At the top, William B. Bell, American Cyanamid Co. Below him, A. E. Marshall, Rumford Chemical Works.

Top right photo is H. C. Haskell, Legal Dept., Du Pont. Below him, (left) L. M. White and M. Kutz of Du Pont. Below them, E. M. Flaherty, Fabrics & Finishes Dept., Du Pont, and M. Du Pont Lee, Rayon Dept., Du Pont. Bottom photo of this group shows (left) E. G. Robinson, Du Pont, and George O. Curme, Jr. of Carbide & Carbon Chemicals.

Dr. E. R. Weidlein, Technical Adviser to the Rubber Reserve Co. and Chief Technical Consultant to the WPB.

Dr. Neil Carothers, Dean, College of Business Administration, Lehigh University.

Below, (left) A. E. Pitcher and J. C. Pickard of Du Pont.

Holds Seventieth Annual Meeting

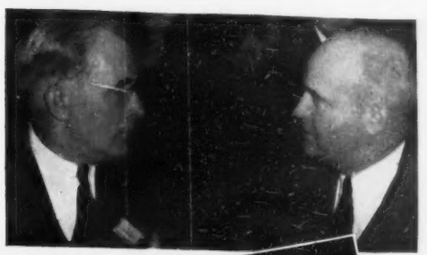
D. P. Morgan, Deputy Chief; Dr. W. G. Whitman and Dr. H. F. Couth, assistant chiefs.

Dr. E. R. Weidlein, Technical Adviser to the Rubber Reserve Co. and Chief Technical Consultant to the WPB, spoke on "Chemists' Contribution to War Program." General Chemical Co.'s motion picture on man's fight against insects and plant diseases, "Combat," was shown to an interested audience.

Dr. Neil Carothers, Dean, College of Business Administration, Lehigh University, was guest speaker at the annual banquet which climaxed the meeting. He spoke on "Our Present Economic Situation." Chemical Industries' photographer took these pictures at the banquet.

Top photo shows F. H. Nichols, General Chemical Co. and Mr. G. Trainer, of the same company. Below that, Mark Bradley, M. M. Biddison, also of General Chemical.

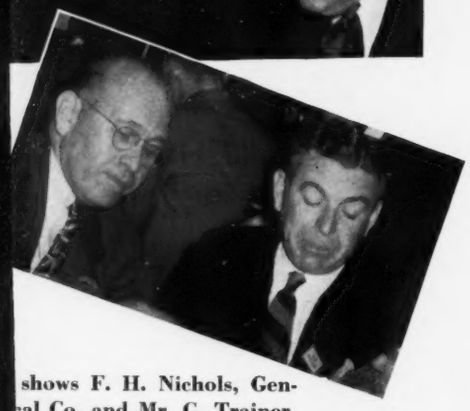
At the left, the photos from top to bottom show: top photo, (left) L. A. Hully, National Carbon Co. and J. R. Hoover, Synthetics Division, B. F. Goodrich Co. Center photo, (left) W. C. Stauffer and James K. Hunt of Du Pont. Bottom photo, (left) Warren Kinsman and C. B. Dutton of Du Pont.



Top photo of this set shows A. J. Campbell and H. P. Eastman of American Cyanamid. Below that, R. H. Hochelman and A. Scharwachter of the same company.

Scene at the Union Dinner showing the speakers' table and part of the assembled group.

Below, H. F. Merriam, Consultant, General Chemical Co., and Dr. Ludwig Rosenstein of the same company.



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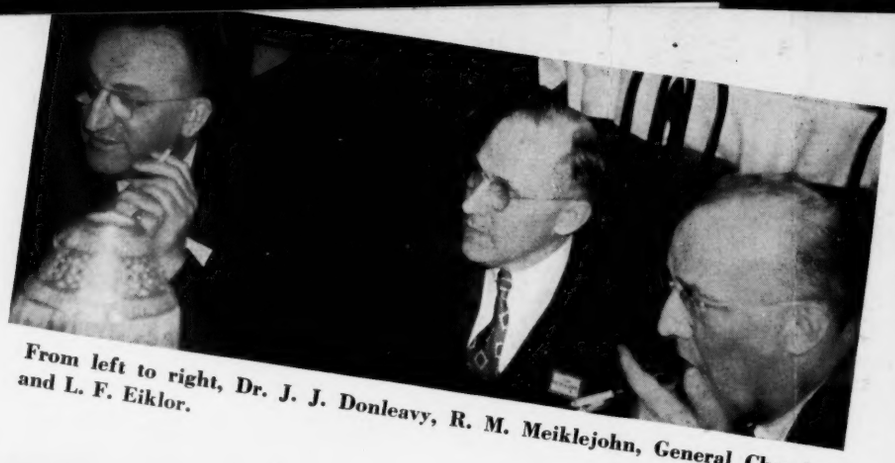

From left to right, Dr. J. J. Donleavy, R. M. Meiklejohn, General Chemical, and L. F. Eiklor.

Left to right, C. A. Higgins, Walter Annette and Lloyd Mitchell all of Hercules Powder.

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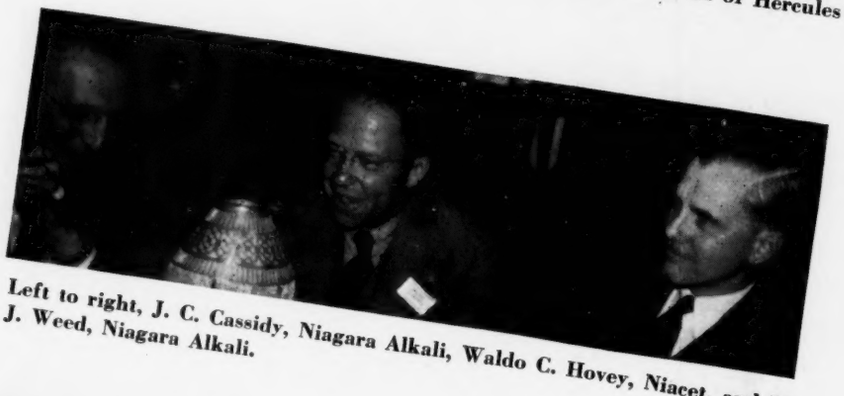
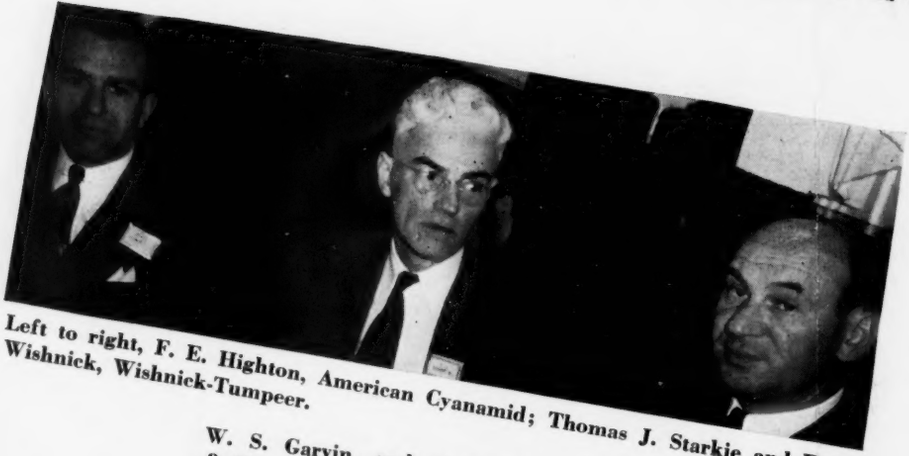


Left to right, J. C. Cassidy, Niagara Alkali, Waldo C. Hovey, Niacet, and W. J. Weed, Niagara Alkali.



Left to right, F. E. Highton, American Cyanamid; Thomas J. Starkie and R. I. Wishnick, Wishnick-Tumpeer.

W. S. Garvin, and August Klipstein, American Cyanamid & Chemical Corp.

Consultant, General
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get the "know-how" from these Buflovak catalogs

(*1*) ***Drum Dryers, Bulletin No. 316:*** Drum drying is an economical and continuous method for producing dry materials at low operating cost, applicable to a wide variety of materials. This 2-color catalog describes and illustrates atmospheric and vacuum types for drying solutions and slurries.

(*2*) ***Evaporators, Bulletin No. 310:*** Buflovak evaporators have been developed by combining experience, research and pilot plant tests. Buflovak engineers have developed 15 distinct types of evaporators as standard equipment to meet various industrial applications. This 56-page 2-color catalog discusses evaporation and allied subjects.

(*3*) ***Modern Process Equipment, Bulletin No. 331:*** The complete line of Buflovak and Buflokast equipment is described briefly or listed in this 20-page catalog. Many photographs and drawings are used along with specification tables to make the descriptions helpful and informative.

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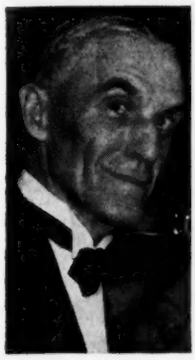
National Fertilizer Association

(*Continued from page 56*)

ing year and H. B. Baylor reported the slate of officers as proposed by the nominating committee.

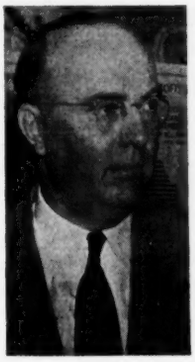
On Friday evening, Dr. Edward C. Elliott, president of Purdue University addressed the annual dinner meeting with an entertaining and thought-provoking talk entitled "The American Way and the American Waywardness." At the close of his address he was given an ovation, called back to the platform in fact, to continue talking for several minutes.



Dr. Elliott

Scientific Progress

Progress in the development of scientific aids to the economic production of crops has been rapid since the last war, according to Robert M. Salter, Chief of the Bureau of Plant Industry, U. S. Department of Agriculture in the first address of the Saturday morning session. "Plant breeders have produced varieties and strains of grains, forage and fiber crops, vegetables, and fruits that are higher yielding and superior in quality than the crops that were grown only a few years ago.



R. M. Salter

"As the result of a research program that has been carried on for more than twenty years and which is now nationwide, machinery for planting and fertilizing most every crop has been improved, and the increased yields obtained through better methods of applying fertilizers are worth many millions of dollars annually.

"Through the cooperation of the research and extension departments of the State Agricultural Colleges, the U. S. Department of Agriculture, and the fertilizer industry: the plant food content of fertilizers has been increased and the grades of fertilizer which are recommended by agronomists are now widely used in nearly every state.

"Agronomists are now able to diagnose crop and soil needs much more accurately than only a short generation ago and because of this fertilizers are being used more intelligently than ever before. Moreover, we can determine rather accurately where and on what crops fertilizers are most needed in order to meet our war crop goals. Also because of our efficient production of crops of better quality we are able to feed our livestock and our people more adequately than in any previous period in our history."

Danger of Inflation

Dr. Dexter M. Keezer, Deputy Administrator, Office of Price Administration, was then introduced and talked on "The Farmer's Stake in the OPA Program." He stressed the necessity of price control if we are to avoid inflation and its consequences. He pointed out the tremendous saving to the Government as well as to the companies and individuals in the conduct of the war through holding prices down to reasonable levels. He claimed that farmers should be especially interested in the OPA program since they have suffered more than other groups during previous inflationary and recovery periods.

Dr. Keezer

Transportation Problems

One of the most important problems facing the industry was discussed by Edward J. Buhner, Chief, Operations, Property Carriers, Office of Defense Transportation in his talk "Truck Transportation in the War Emergency." In his talk Mr. Buhner stressed the importance of conserving rubber and trucks. This conservation of transportation facilities can be greatly helped by drastic revision of many existing practices and a studied program of increasing efficiency. Distributors must be impressed by the necessity of these steps if fertilizer distribution is not to break down in 1943 or 1944 when we may need its benefits most.

E. J. Buhner

Since the convention the Office of Defense Transportation has issued general permits relieving common carriers, contract carriers, and private carriers from compliance with the return trip provisions of ODT General Orders Numbers 3, 4, and 5 respectively for a period of fifteen days beginning July 1 and ending July 15, 1942. These provisions require that trucks be loaded to 100 per cent of capacity on the going trip and to 75 per cent on the return trip or vice versa, and except for the permits or some similar action would have become effective on July 1. ODT said that the postponement of the effective date of the provisions was made to allow more time for a general revision of orders governing trucks operated by common, contract, and private carriers.

The ODT has also taken jurisdiction over all shipments of export freight to ports by any type of carrier, looking to the prevention of port congestion. Anyone contemplating export shipments should obtain detailed instructions from ODT or from the Office of Export Control, Board of Economic Warfare.

Elections

At the Board meeting held immediately after adjournment of the convention, the following officers were elected: President, John A. Miller, Price Chemical Co., Louisville, Ky.; Vice-President, H. B. Baylor, International Minerals & Chemical Corp., Chicago; Executive Secretary and Treasurer, Charles J. Brand, Washington, D. C.

Elections to Board. The report of the Nominating Committee was presented by Chairman H. B. Baylor. The following Directors-at-Large were nominated and elected for a term ending in June, 1945: C. T. Brown, Federal Chemical Co., Louisville, Ky.; John A. Miller, Price Chemical Co., Louisville, Ky.; H. S. Parsons, Naco Fertilizer Co., New York, N. Y.; L. W. Rowell, Swift & Co. Fertilizer Works, Chicago, Ill. Directors nominated by the Districts and elected for the full three-year term were: District 1, E. S. Russell, Old Deerfield Fertilizer Co., South Deerfield, Mass.; District 4, Lionel Weil, Weil's Fertilizer Works, Goldsboro, N. C.; District 5, Geo. W. Gage, Anderson Fertilizer Co., Anderson, S. C.; District 8, James W. Dean, Knoxville Fertilizer Co., Knoxville, Tenn.; District 9, N. E. Harman, Meridian Fertilizer Factory, Hattiesburg, Miss.; District 10, W. B. Norris, The Norris Fertilizer Co., Rushville, Ind. W. H. Gordon, Chamberlin & Barclay, Cranbury, N. J., was elected to fill a vacancy in District 2 expiring in June, 1943. M. A. Caine, Tennessee Corp., New York, N. Y., was elected to fill a vacancy in District 2 expiring in June, 1944. John F. Blain, The Chas. H. Lilly Co., Seattle, Wash., was elected to fill a vacancy in District 11 expiring in 1944.

N.A.I.D.M. Meets in Chicago

(*Cont. from p. 88*)

around the top and bottom. It is lined with an especially impregnated liner. It is water-proof, it is light, it is strong, and it is cheap. It costs less than three-quarters as much as a one-use steel drum. You may take my word for it, this new fibre drum is exceedingly attractive.

"It all depends upon whether you want to use substitute containers or not. I don't think you should consider not wanting to.

"And then there is tight cooperage. You know as much as I do about it. But let me tell you that you are missing a bet if you don't use kegs as a merchandising weapon. Many of them are used by the ultimate consumer. What would happen if you shipped your product in a white keg with red and blue bands? Even call it a "Victory Keg" if you like. Turn it to an advantage rather than be forced, grumbling, into using it.

"Here is another reason why you shouldn't wait, but should start at once to investigate new containers. The Tight Wood Cooperage Association tells me that their industry can turn out, on a 40-hour week basis, six million more 55-gallon equivalents a year. But they can't jump into this kind of production over night. If you couldn't get any more steel, or were forbidden to use steel containers tomorrow, what would you use?

"Production of any containers, wood cooperage, glass, or fibre must be built up gradually. Assembly lines have to be formed, labor and materials have to be arranged. If you will give the manufacturers of substitute containers some warning, if you will start to use them gradually right now, you will be assured of the containers you need to avoid suspension of operations."

Afternoon Session

"Economies will be necessary to win this war," Dr. Paul Poirot of the Office of Price Administration told the afternoon session in his paper, "Questions on Price Ceilings as They Affect Insecticides and Disinfectants."

Raw materials, he said, must be used conservatively. Certain types of containers will be restricted or unavailable, which may result in some standardization of packages for the insecticide industry with a considerable reduction in costs. The business man who is able to produce the most goods at the lowest cost is going to be most successful. Neither the war nor the OPA has changed that, he added.

Floor Wax Emulsions

C. S. Kimball of Foster D. Snell, Inc., spoke on "Shelf Stability of Floor Wax Emulsions," giving the results of tests conducted at the Snell laboratories.

Proposed Committee

Melvin Goldberg of the Inorganics Section, Chemicals and Allied Products Branch of the WPB, discussed "The Proposed Industry Committee for the Insecticide Industry" and urged the association to recommend an advisory group immediately. He said the WPB can only help solve the industry's problem with the help of such a committee and that the association had much to gain by it.

Transportation Problems

Last speaker on the well-organized and well-planned program was George M. Jackson, Assistant to Director, I.C.C., who said that "transportation is one of the greatest, if not the greatest problem of the present emergency."

"The railroads alone will not be able to solve the transportation problem," Mr. Jackson warned, "even though they are doing everything in their power. It will be necessary for all individuals and groups who used freight equipment to exert the best efforts toward a solution."

In addition to eliminating the causes of car detention, Jackson called for shippers and consignees to work their loading and unloading crews 24 hours a day and seven days a week to release cars promptly.

The Interstate Commerce Commission, he said, maintains the position that no individual or industry can be permitted to hold up cars at the expense of others. He asked for the cooperation of the insecticide and disinfectant industry in speeding up loading and unloading for the release of cars and warned that the commission would like to see it done on a voluntary basis. "We have powers that we can use if you don't," he concluded.

Next meeting of the association will be held Dec. 7 and 8 at the Hotel Roosevelt, N. Y. City.

More photos taken at the meeting. Left to right, Melvin Fuld, Fuld Bros., Baltimore; Dr. F. L. Campbell, Ohio State University; Dr. E. G. Klarmann, chairman of the disinfectant scientific and commercial standards committee, (Lehn & Fink), who reported on the four proposed phenolic disinfectant emergency specifications.

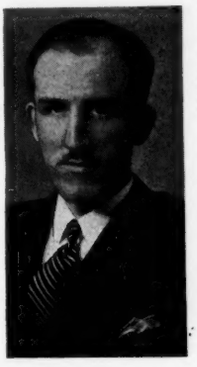
CANADIAN REVIEW

By Kenneth R. Wilson

OTTAWA—The question which U. S. businessmen ask most often about Canada is something like this: "Why don't you have conscription? How can you fight an all-out war without it?"

That is a fair question—a question which deserves a fair answer. Briefly the answer is this:

1. Though Canada has always had compulsory service for home defense she has traditionally "glorified" the voluntary enlistment of men for her armed services.



K. R. Wilson

2. Canada has made a greater success of voluntary enlistment than any other country in the world. Over 500,000 men have enlisted voluntarily for service anywhere in the world since 1939. Proportionately this would represent in the United States an armed service of almost 6,000,000.

Despite this extraordinary record, the issue of conscription for overseas service has been on the front pages of every Canadian newspaper for the past month or more. The reason is that the House of Commons here at Ottawa has been debating a resolution to free the government's hands in sending outside this continent, men called up for army training and active service for home defence, under the draft plan. The debate follows a national plebiscite in which Canadians were asked whether or not they wished to free the government from "any obligation arising out of any past commitment restricting the methods of raising men for military service." About 3,000,000 Canadians voted, with 64 per cent. releasing the government from its previous anti-conscription pledges. In the powerful French-Canadian province of Quebec (traditionally opposed to conscription of men for overseas service) the vote was reversed and seven out of ten voted "no."

Following the vote, the government asked Parliament to repeal the clause in the "draft" law which restricts service of "draftees" to home defence. At once, a Quebec cabinet minister and the majority of French-Canadian members of the house "walked out" on the government; said they could not support such an amendment since they had been given no mandate to do so by their constituents. Eventually, Canadians expect, the amendment will be passed though the debate will last a full month.

Passage of the amendment will free the government from any restraint in respect of conscription for overseas service, but that will not mean that Canadian draftees will automatically be sent overseas. The government must still issue a proclamation. It is the government view that at present the need for such a proclamation does not exist.

In Canada, conscription for overseas service, though it has been a political storm center both in this war and in 1914-1918, is by no means the key to Canada's wartime contribution of manpower. On the contrary, it beclouds the amazing contribution made by this country under the voluntary enlistment system.

The democratic way for America to raise an army in wartime is by means of the draft. Canada, for reasons which go deep into the history of French-English conquest and occupation, has held to the voluntary system even though it broke down in the third year of Great War I. She started to fight the present war under voluntary enlistment and today this striking fact emerges:

The total number of men and women who have voluntarily enlisted in the armed forces in Canada for service anywhere in the world is now 505,000.

On a comparable population basis this would represent a contribution of about 6,000,000 United States soldiers, airmen and sailors.

Added to that, Canadians are still enlisting voluntarily at a rate in excess of 15,000 a month (the comparable United States figure would be about 180,000).

Compared to these totals, the number of men which the Canadian army has called under the draft system for home defense (shortly to be enlarged to hemisphere defense) is small—about 56,000. Over a third of these have subsequently enlisted voluntarily in the active (overseas) force.

Compulsory military service for the defense of Canada has always been the law of the land. In this war it was reaffirmed by a statute called the National Resources Mobilization Act, 1940. But going back to the early days of Confederation, the Canadian Militia Act of 1868 contained a provision for a levee "en masse" of all male inhabitants from 16 to 60 years of age. It was the law of French Canada during the period of the French regime under the militia act of 1758, and similarly under the feudal law of fiefs.

Looking at the Canadian manpower problem in its broadest perspective the picture is something like this:

Out of a working force of 5,000,000 persons:

1,350,000 are engaged in agriculture (Canadian farms will supply more than a third of a billion dollars worth of bacon, cheese, eggs, wheat and flour to Britain this year).

800,000 are engaged in production of war materials and supplies. (Canadian war production has for some time been geared to a production rate of $2 billions annually with employment increasing at the rate of 28,000 monthly since the beginning of 1942.)

500,000 are in the armed forces.

300,000 are in essential utilities and mining.

This leaves only two out of five (about 2,000,000) to carry on all civilian work.

Comparable figures for the United States would distribute a manpower pool of 56,000,000 as follows:

15,000,000 in agriculture (exclusive of housewives).

9,200,000 in war industry.

6,400,000 in the armed services.

3,400,000 in essential utilities and mining.

The balance (about 22,000,000) left to carry on civilian occupations.

Thus, one out of every ten of Canada's working population has voluntarily enlisted in the armed services; only one out of 100 has so far been required to be called up for home defence. What is expected to emerge from Canada's present manpower debate in the Commons is a clear commitment from the government that as soon as conscription for overseas service is deemed necessary by the military authorities the government will act accordingly. So long as the present flow of volunteers continues, the government takes the view that conscription for other than home defence is unnecessary and might in fact be detrimental to the Canadian war effort when viewed as a whole.

As at July 1st, Canada moved into formal coupon rationing of sugar. (All Canada has been subject to voluntary rationing of sugar since January and all motorists have been on a coupon ration plan for gasoline since April.) Some 80,000 volunteers, men and women, conducted a national registration in the last ten days of June and the stage is now set for the addition of other commodities as the need arises.

Prices Czar Donald Gordon argued vigorously against coupon rationing up till the last minute but was finally persuaded that most coupon rationing troubles arise when the plan is introduced too late, or is not tied into a unified plan. Since sugar is the simplest of all com-

(*Continued on page* 108)

FOREIGN LITERATURE DIGEST

By T. E. R. Singer

REVISTA DE AGRICULTURA DE PUERTO RICO (San Juan 1941) p. 629-35.

AGRICULTURAL RESEARCH IN PUERTO RICO: An address was delivered by the Commissioner of Agriculture and Commerce of Puerto Rico, I. A. Colon, at the meeting of Agricultural Scientists of Tropical America held at Fortaleza, Oct. 27, 1941.

Graduates of the College of Agriculture in the city of Mayaguez who are particularly promising are given an opportunity by the government to go to the United States to obtain their Master's or Doctor's degree. Experimental work in agriculture is conducted under the leadership of two agricultural experiment stations, a U. S. Government station located near the College of Agriculture and the experiment station of the University of Puerto Rico. Both organizations are subdivided into divisions of chemistry, economics, engineering, entomology, genetics, parasitology, phytopathology, phytotechnics, plant physiology, soils, etc. The experiment station of the University of Puerto Rico recently completed a soil survey of the entire island, in cooperation with the Bureau of Chemistry and Soils of the U. S. Department of Agriculture.

The Agricultural Extension Service originated in 1918 and is composed of a number of specialists in horticulture, forestry, agricultural economics, animal husbandry, 44 agricultural agents, 21 home demonstration agents and 9 demonstration farms. Its main objective is to visit the farms and use all known methods of propaganda to reach the farmer and assist him in the solution of problems in connection with the cultivation of sugar cane, tobacco, coffee, cotton, vegetables, etc., soil conservation, animal husbandry, veterinary work, cow testing and agricultural economy. They also raise the standard of living by advising in household problems.

The routine regulatory work and other phases of agriculture and industry are the duties of the Department of Agriculture and Commerce and are distributed among the Plant Quarantine Service, the Fertilizer and Feedstuff Inspection, the Chemical Laboratory Inspection, the Coffee and Tobacco Inspection and partly the Veterinary Service. Then there are the Divisions of Ornithology and Pisciculture, the Insular Forestry Service, the Animal Husbandry Service and the Division of Agricultural Development for wildlife conservation, development of fisheries, forests and livestock.

Under the Lopez Dominguez subsistence crop planting program, 14,700 acres of land were planted during the year 1940-41 by 7,582 laborers in order to alleviate unemployment among sugar mill workers during the off-season. It is intended to extend this planting program.

Soil conservation activities were started in 1936 by the U. S. Conservation service and have continued since then with money appropriated by the Puerto Rico Reconstruction Administration.

Eradication of the fever tick was started by the Puerto Rico Reconstruction Administration and over $1,700,000 was spent on this campaign.

It is intended to establish a Crop Forecasting Section which will provide information on areas under cultivation, probable crop yield, storage of agricultural products and sale price, which will aid in marketing.

A great deal of work has been done on bovine tuberculosis in cooperation with the United States Department of Agriculture.

There are 32 farm bureaus in operation. For every dollar subscribed by the members of the bureaus, the government matches with an equal amount so that seedbeds of tobacco and vegetables, use of farm machinery, etc., are handled for the best interests of the community.

The Puerto Rican Coffee Price Stabilizing Corporation was organized in May 1940 and is authorized to buy, sell, manipulate and pignorate coffee produced in Puerto Rico and to grant subsidies on their surplus coffee which may be exported. There is an agreement that 2c. will be granted for every pound of coffee diverted to continental United States markets. During the last 2 years $126,023 has been received as benefit payments for the diversion of 6,371,155 lbs. of green coffee shipped to the continental United States. An insular subsidy was granted by the corporation during this period at the rate of 3c. per pound of coffee exported, totalling to $191,378. These programs have helped stabilize the coffee market. The price for Puerto Rican coffee in the New York market in 1941 fluctuated around 12c. a lb. The minimum price for raw coffee for local consumption was 18½c. a lb. It has been calculated that about 500,000 persons depend directly or indirectly on the coffee industry of Puerto Rico.

The Land Authority of Puerto Rico has been organized to break up the big holdings of land by limiting the land holdings of agricultural corporations to 500 acres.

Efforts are being made to raise the standard of living by preparing a scale of wages, development of water resources for cheap electricity and power, and for irrigation.

Methods are being introduced for the preservation of sea food so as to encourage deep sea fishing and thus supply the necessary protein in the diet of the island.

The Agricultural Conservation Program has been in progress for six years now with nearly all the farmers in Puerto Rico (about 88,000) participating. It has been instrumental in extending the planting of productive nondepleting cover crops in rotation with other crops, green manuring and permanent pasture; the planting of various trees; contour cultivation; ditching of hill sides to prevent erosion; proper maintenance of trees and finally the application of proper quantities of lime and fertilizer to farm lands.

There are special programs for tobacco, sugar growers, etc.

The U. S. Government spent nearly $2,000,000 on Puerto Rican agriculture, whereas the government of Puerto Rico, as such, spent over $1,500,000.

CANADIAN REVIEW

(*Continued from page* 107)

modities to ration, and since stocks are still reasonably ample, the proponents of coupon rationing convinced Mr. Gordon that an ounce of prevention was worth a pound of cure.

The sugar plan is extremely simple; is estimated to cost about 10 cents per capita to introduce and administer. Administration is estimated to require only 1200 persons at most, operating through 106 branch offices. This assumes a big measure of voluntary support and cooperation such as Canadians have given in generous measure so far to the price ceiling and other restrictive war controls.

And for further proof that Canadians really mean business in fighting on the wartime economic front, came in Finance Minister Ilsley's budget on June 23rd. Its highlight was the striking fact that Canada leads the United Nations in its determination to close the inflationary gap caused by vast wartime spending.

Out of a total federal expenditure of $3.9 billion (seven and a half times normal) the stern, realistic Mr. Ilsley plans to raise $2,228 billions by taxation and by doubling present savings from war savings certificates and Victory loans.

The budget rounds out Canada's well-integrated wartime plan: rigid ceiling on prices, wages and salaries; rationing of commodities in short supply; syphoning off excess spending power by greatly increased taxes and a doubling of present borrowing from the Canadian public.

MARKETS IN REVIEW

By Paul B. Slawter, Jr.

Heavy Chemicals — Fine Chemicals — Coal Tar Chemicals — Raw Materials — Agricultural Chemicals — Pigments and Solvents

THESE first few remarks are going to be about recommendations. Many people call this office and ask "what do you recommend that I do in this case?" or "what office of the government do you recommend I see to sell this to?" or "where can I get this information?" Well, here are a few spots for information that we've recommended. You might like to use them yourself.

If it's information about the work of the agencies in the Office of Emergency Management you're looking for then get the official weekly bulletin of that office, "Victory". It's published by the Division of Information, OEM, and costs 75c for 52 issues. If you want all the latest condensed facts on the national economy get "Domestic Commerce," weekly bulletin issued by the U. S. Department of Commerce at $2 per year. The War Production Board publishes, by states and sections, a weekly "War Production News" which gives you just what it says. For suggestions and information on chemical safety get the bulletin by that name issued by the National Safety Council, Inc., 20 N. Wacker Drive, Chicago.

And if it's conversion you're interested in and how to go after war work, get the material issued by the Division of Information, WPB, Washington.

Someone asked us to publish the addresses of the procurement agencies of the Chemical Warfare Service. Here they are:

Boston, Room 2000, Post Office and Courthouse Bldg.

Chicago, Room 1506, North Wacker Drive.

New York, 292 Madison Ave.

Pittsburgh, American Bank Bldg., 6th Ave. and Grant St.

San Francisco, Room 201, 1355 Market St.

Among the things the government put into effect last month affecting the chemical industry in one way or another were the following:

Chemical manufacturers were authorized to build up inventories of coal and coke, in a nation-wide drive to encourage accumulation of fuel stocks in anticipation of heavy war demands on transportation facilities. For the same reason, the inventory restrictions of Priorities Regulation No. 1 were removed from paper, paperboard, paper products and waste paper.

Civilian quotas of anthraquinone vat dyes and other anthraquinone dyes for the coming quarter have been set at the rate of 70% of their use in 1941 as against 50% for the quarter just finished. Shippers of carbon tetrachloride may charge a reasonable deposit on the steel drums used in transporting the product. A price regulation will be issued governing the prices at which importers of English cresylic acid may resell the material. Bauxite and alumina are under complete allocation control. Controls over distribution of cobalt are extended indefinitely. Starting August 1, no tricresyl phosphate and triphenyl phosphate in any form may be used, delivered or accepted without specific authorization by director of industry operations, with certain exceptions. All deliveries of butadiene must be specifically approved by the director of industry operations. Procedure on purchases of small quantities of arsenic has been simplified. Control over antimony has been revised because supplies have become relatively more plentiful. Zinc Oxide ceiling date has been changed to May 11. Calcium hypochlorite and chloride of lime (high test) are now under control of director of industry operations who must approve all deliveries. Maximum prices set for mercury in Schedule No. 93 apply to every grade and kind. Restrictions on use of chrome chemicals, particularly in pigments and printing inks industries, have been relaxed. Ethyl cellulose is under allocation. Hundreds of thousands of tons of critical materials now frozen in idle inventories are being freed for vital war production by WPB.

Shipping: The Department of Commerce reports that U. S. merchandise exports, including lend-lease shipments, exceeded merchandise imports by $1,250,000,000 in the first four months of this year. At this rate, a new export record will be set in 1942. Imports, as a whole, were barely holding their own with a year ago, the report said.

Heavy Chemicals: Inquiries for export are rampant on the following: solid caustic soda, soda ash, lead arsenate, lithopone, potash salts. Copper sulfate exports are going out in quantity for mine flotation processes. The gradual readjustment of prices in the export market has brought many items close to manufacturers schedules. There is some caustic soda to be had from exporters who bought for export but can't get the shipping space. Oxalic acid is available in some quarters for export at prices near the domestic schedule. Rain has caused a decreasing demand for calcium chloride in general throughout the country. Government buying of this product is expected, however, for concrete curing and air drying on many projects. Acetic acid is reported to be in better quantity. Industries working on government orders are taking good quantities of alkalies. Domestic consumption should be high enough to eat up all outside lots. All available ammonia is going into war industries. More and more ammonia goes to ordnance plants each day as new plants are completed and put into operation. After present supplies of bichromates in dealers' hands are exhausted there won't be further supplies because of restrictions. Chemical consumption will increase materially in the months ahead with war industries and lend-lease taking voluminous supplies.

Fine Chemicals: Food and Drug Administration recently released an opinion in which it was stated the propylene glycol may be substituted for glycerine in any non-official article where glycerine itself may safely be used without increasing the toxicity of the end-product. Further restrictions have been placed on the use of cellophane. Toiletries and Cosmetics Branch of WPB recently urged manufacturers to seek substitutes for certain chemicals which are in critically short supply. The Branch pointed out that mannitol, sorbitol, and their derivatives are available only for orders bearing high priority ratings. In addition, it was emphasized that a tight supply situation also exists for wetting agents and emulsifiers, such as sulfonated coconut oil or lauryl alcohol.

Following a study of substitutes for materials that are or may become critical, the scientific advisory committee of the Toilet Goods Association, Inc., has recommended to members a list of substitutes for menthol, quince seed, spermaceti, thymol and tragacanth. Regarding acetone and ethyl acetate, lanoline alcohol and hydrogen peroxide, the committee stated that the situation has improved and supplies are now available without too much difficulty.

With regard to menthol, it was stated, partial substitution can be made with peppermint oil. Synthetic menthol, although not readily available, is suggested by the committee as a substitute in some cases.

As substitutes for sweet almond oil, the committee recommends that oils of domestic or Western Hemisphere origin be studied. Quince seed is very difficult to obtain, the committee stated, and suggests use of other gums if obtainable. It is recommended that Irish moss, alginates and pectin be investigated as substitutes.

Spermaceti, it is thought, will become increasingly difficult to obtain and certain hydrogenated products are said to be available to take its place.

With regard to thymol, the committee suggests that where this material is used for its antiseptic properties, other antiseptics be studied. Although difficult to obtain, red oil of thyme may be used as a substitute in some cases. Tragacanth ribbon, the committee stated, is very difficult to obtain, although the powdered product is somewhat more readily obtainable, and suggested that Irish moss, alginates and pectin be investigated.

Anti-freeze—Maximum Price Regulation 170 issued effective June 30, set up a schedule of maximum prices for anti-freeze. Sales to a retailer, depending upon the size of the containers, range from 87c to 99c per gallon delivered for Type N and from 61c to 70c per gallon delivered for Type S. The retail selling price is set at $1.40 per gallon for Type N and $1.10 per gallon for Type S.

Coal Tar Materials: The government is taking huge quantities of benzol for future use in synthetic rubber manufacture. Large quantities are also going into the manufacture of aviation gasoline. Toluol and phenol are going into the war industries in such quantities as to leave little for derivatives. Crude and refined naphthalene are a little easier to get right now. Betanaphthol is scarce. Dye manufacturers are using intermediates in large quantities giving producers some qualms over where they can obtain much-needed crude materials. You can't find any metatoluidine in the spot market. WPB has removed the price ceiling on toluol from petroleum to stimulate production. Benzol went under complete allocation July 1.

Natural Raw Materials: A slackening of demand, the first sign of weakness in several months, was noted in May and early June in wholesale markets for fats and oils. With maximum wholesale and retail prices now in effect, there is little incentive for dealers and industrial and institutional consumers to maintain inventories of finished goods beyond normal needs. Some liquidation of excess inventories of finished fats and oils apparently is taking place, with a consequent decline in sales by manufacturers.

The current reduction in wholesale purchases may result in a smaller factory consumption of primary fats and oils in the second quarter of 1942 than in the first. But with consumer purchasing power expected to rise still further during the year and with maximum prices in effect, a high rate of retail purchases of goods manufactured from fats and oils is in prospect. Hence the rate of factory operations may be increased in the second half of the year. In the absence of Government restrictions, total domestic disappearance of primary fats and oils in 1942 probably will equal or exceed the 11 billion pound mark reached in 1941.

Purchases for lend-lease shipment will add to requirements for fats and oils. According to present indications, more than 1 billion pounds will be purchased for this purpose by the Department of Agriculture this year. Purchases in 1943 are likely to be even larger, although needs may be modified by war developments.

Large quantities of synthetic resins and plastics, drying oils and solvents, requisite for war manufacture are being saved by the substitution of soybean and casein proteins in industrial processes. War effort demands huge amounts of such solvents as ethyl alcohol, employed in smokeless powder, coal tar solvents like toluol, necessary in making TNT, and chlorine, an intermediate in the processing of war gas and smoke screens. By permitting use of emulsion processes instead of solvents in non-war industries, these agricultural proteins release critical chemicals for more important purposes.

An expansion in the use of soybean and casein protein as replacement for tapioca starch, as a film forming agent in paints and adhesives, as an emulsifying agent and stabilizer is suggested by the Bureau of Industrial Conservation as a means of saving other chemical substances. Other instances in which these proteins may be substituted include the manufacture of laminated fibre-board, textile dressings, synthetic fibres, and glue.

Shortages, present and potential, in paints, plywood, adhesives, critical solvents, and special plastic applications can be relieved to some extent by turning to the plentiful supplies of agricultural protein, soybean and casein, for substitution purposes.

Improvement in the supply situation on a number of the important raw materials used in the paint industry is reported by the National Paint, Varnish and Lacquer Association in a bulletin issued for publication last month. Among developments reported by the association are the following:

Titanium: The demand for titanium dioxide which was very heavy in April dropped off in May and a further drop is indicated in June. There is plenty of titanium dioxide for all needs at the moment and what the industry is most interested in is orders.

Zinc Oxide, Zinc Sulfide: At the present time there is an adequate supply of American process zinc oxide for defense needs and normal civilian uses. The situation as a whole on zinc sulfide can be considered satisfactory.

Lead: The lead supply situation has shown a great change for the better during the last few months. So much lead has been imported that the government has been able to accumulate a stockpile without affecting military demand and with only slight effect on civilian needs. Today there is no shortage in any of the lead pigments.

Soybean Oil: The crop estimates so far promise the largest harvest in history. It is anticipated there will be a substantial supply for the paint industry.

Tung Oil: There is little change in the tung oil situation and regulations continue to deny use of the material without requisite priority ratings.

Dehydrated Castor Oil: Castor bean arrivals have statistically made a very strong picture in the matter of arrivals up to date this year following unusually heavy arrivals during 1941 and there is no shortage of beans. However, the shipping situation has deteriorated gradually in the past few months as it is well known and arrivals of beans have shown a marked falling off. Milling and processing facilities here are now working to capacity, but it is futile to expect these limited facilities to be adequate to offset the increased demand for castor oil brought about by almost complete curtailment of the importations of wood oil, perilla oil and oiticica oil.

Dry Colors: There has been a very decided decline in the consumption of most inorganic chemical colors, and with the exception of a very few items, consumers are having little difficulty in obtaining whatever quantities they desire. Organic colors are relatively "free" at present, too, but it would appear that the requirements of the defense program may result in a scarcity later on.

Inerts: There has been no change on these products. The only possible cloud may be one of transportation. All orders are being taken care of promptly.

Solvents: Supplies of ethyl alcohol are currently ample for all the essential requirements, inasmuch as productive capacity has been largely augmented by conversion of registered distilleries to the production of industrial alcohol. Ethyl acetate and butyl acetate and other acetate esters are in an easier position due, for the most part, to the non-availability of nitrocellulose for lacquer formulation, except for direct defense requirements.

The carbon black industry reflected the demands made by the war in 1941, reaching an all-time peak both in production and in sales.

Production in 1941 was 594,065,000 pounds, 4 per cent above the record established in 1940; total sales were 644,744,000 pounds, 22 per cent above the 1940 figure, and 15 per cent above the record of 1939.

There were 365,377,000,000 cubic feet of gas burned in the manufacture of carbon black in 1941. The average yield increased from the peak of 1.54 pounds per thousand cubic feet in 1940 to 1.63 pounds in 1941. This gain was largely

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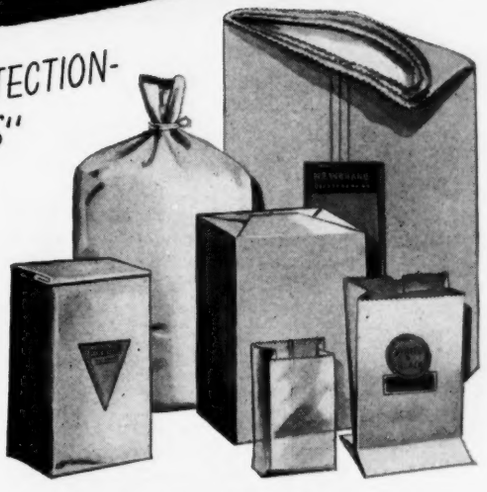

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due to an increase in furnace blacks, which have a relatively high average yield.

The average price per pound of carbon black in 1941 was 3.26 cents, the highest since 1937 when 3.41 cents was recorded. Prices were raised the first of April and there was another advance in July.

Figures on exports are available for only the first 9 months of 1941, but comparison with a similar period in 1940 indicates a marked decline in shipments to foreign countries.

This decline was offset by domestic sales, which advanced in all classes except deliveries to paint companies.

Production of solvents and chemicals from southern pine wood should be sufficient to meet the wartime needs of the rubber reclaiming industry, Charles A. Higgins, president of Hercules Powder Co., announced with the opening of the nation-wide campaign to collect scrap rubber for the war effort.

To conserve supplies of chemicals vital in the manufacture of munitions and other war materials, the Industrial Salvage Section of the Bureau of Industrial Conservation, War Production Board, urges users of solvents to turn in their used solvents to reclamation plants for recondensing and re-use.

The principal users—dry cleaners, rotogravure printers, metal degreasers, wire insulators, solvent extractors and others—are asked to secure from the WPB a list of the solvent reclaimers in the country, in order that benzol, needed to make synthetic rubber, and toluol, which goes into TNT, can be made available for the war effort. Copies of the list may be secured from S. Donald Perlman, Chemical Director, Industrial Salvage Section, Bureau of Industrial Conservation, Washington, D. C.

An educational program on the salvage of solvents is now being conducted for the purpose of familiarizing industry with the fact that many solvents that cost 20 cents a gallon can be reclaimed for 2 cents a gallon. Dirty, contaminated solvents can likewise be made to work again by reclamation, which is accomplished by distilling and centrifuging.

One billion pounds a year are now being saved by condensing vaporized solvents. The capacity for reclaiming solvents can easily be stepped up 50% to 75% and the principal types that can be reclaimed include alcohols, chlorinated compounds, esters, ethers, hydrocarbons and ketones.

Tanners' stocks of raw hides and skins improved at the close of April and were generally higher than a year ago.

Active trade in tanning materials was reported for the month of May, with producers and sellers making deliveries as promptly as possible. Efforts are being made to keep consumers from accumulating inventories in order to keep the business on a steady month-to-month basis.

Chestnut-extract producers have been able to meet the increased demand satisfactorily and are operating close to capacity. Their sales of extract during the first four months of this year were more than 16% greater than a year ago.

The domestic chrome situation is still receiving considerable study, and the local supplies will be usable. This development will eliminate much of the possibility of a shortage, and supplies will be available to tanners in required quantities.

Members of the trade believe that the General Price "freeze" will stabilize selling prices on most tanning extracts. This will help in preventing large inventory accumulations by consumers who were fearful of price advances.

Tanners engaged in making military leathers, as well as most others, have been able to obtain sufficient chrome to fill their requirements.

Despite the price "freeze," the market for tanning materials was active throughout May. Tanners are operating at a high rate of activity and are consuming tannins constantly, so that replacements are necessary. Continual strong demand prevailed for the staple types, but many newer kinds are enjoying steady sales.

TABLES and CHAIRS for CAFETERIAS and LUNCH ROOMS

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U.S.I. CHEMICAL NEWS

July ★ A Monthly Series for Chemists and Executives of the Solvents and Chemical Consuming Industries ★ 1942

New Use Discovered For Ethyl Formate In Treating Yarns

Improves Extensibility of Cellulose-Derived Filaments

SPONDON, England — What is believed to be a hitherto unknown aspect of ethyl formate's utility is revealed in a patent recently granted to two inventors here. This chemical, previously known chiefly as a fumigant and a reagent in organic synthesis, has now been found to be markedly effective in increasing the extensibility of threads, yarns, or fabrics made from organic derivatives of cellulose.

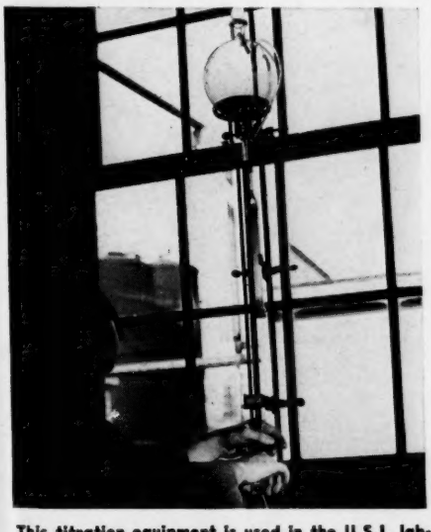
As a typical instance, the patent describes a treatment for dry-spun cellulose acetate yarn which has been stretched in wet steam to 1000% of its original length. The yarn is immersed for ten minutes at 15° C. in a bath of 76% by volume of ethyl formate and 24% of kerosene. After washing and drying, the product is found to be uniformly shrunk and to have improved extensibility, it is reported.

"DRY-ICE" Aids Control Of Reaction Temperatures

JERSEY CITY, N. J. — A novel application of "DRY-ICE"* in controlling the temperature under which organic reactions proceed has been suggested here.

In many reactions, particularly those involving diazotization, temperature control is important for obtaining satisfactory yields, it is pointed out in an article in *The Chemist Analyst*. In reactions of this type, it has been found that additions of "DRY-ICE" are effective in maintaining the desired low temperatures. The inert character of carbon dioxide and the fact that no final concentration change is involved are said to be important advantages.

* Pure Carbonic, Incorporated, sells "DRY-ICE" manufactured by U.S.I.



This titration equipment is used in the U.S.I. laboratories for determining minute quantities of water by means of the Karl Fischer reagent.

Many Novel Reactions Possible With Ethyl Sodium Oxalacetate

Stability of U.S.I. Intermediate is Important Factor in Its Potential Utility in Varied Fields of Chemical Synthesis

While the interesting possibilities for organic synthesis offered by the ethyl ester of oxalacetic ester have been recognized by many chemists, exploration of these potentialities has been hampered by the relative instability of the ester. This difficulty has been overcome by U.S.I.'s production of ethyl sodium oxalacetate. This chemical, the sodium derivative of ethyl oxalacetate, is entirely suitable for most applications in which the pure ester might be used, and has the added advantage of relatively high stability. As a result, it is now possible to exploit the full utility of this unusual chemical.

Ethyl sodium oxalacetate is a fine granular powder, light yellow in color, and, as manufactured by U.S.I., attains a purity of not less than 92%. Its stability is shown by the fact that when a sample previously dried at 100° C. for 1 hour is kept at 100° C. for 24 hours, the loss of weight is not more than 3%.

Up to the present, ethyl sodium oxalacetate has found its chief industrial applications as an intermediate in the manufacture of pharmaceuticals and dyestuffs, particularly in the tartrazine and other pyrazolone groups. The structure of this compound, however, suggests the possibility of many other organic couplings, which may open the way for whole new lines of products.

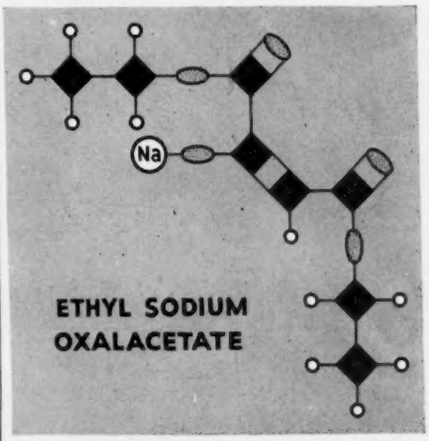
Typical Reactions

While much of the work of investigators has been performed with pure oxalacetic ester, ethyl sodium oxalacetate may be employed with equal success in most of these reactions. Among the typical reactions of oxalacetic ester which may suggest profitable lines of endeavor with the more stable sodium derivative, the following may be listed:

1. Ammonia and many of the primary and secondary amines add on to oxalacetic ester. The resulting products may be converted to the amines of oxalocitric acid lactone ester.

2. If aldehydes are present when amines of certain types are condensed with oxalacetic

(Continued on next page)



The molecular structure of ethyl sodium oxalacetate is shown in this diagram, in which hydrogen atoms are represented by circles, oxygen by ellipses, and carbon by squares. The sodium atom is represented by the large circle.

W. O. Griffen Named General Production Manager of U.S.I.

Mr. W. O. Griffen, formerly Superintendent of the Curtis Bay Plant of U.S.I., has been appointed General Production Manager. He will make his headquarters at the company's Executive Offices in New York, and will assume the duties previously performed by the late A. A. Backus.

W. O. Griffen

Mr. Griffen has been associated with the U.S.I. organization since 1917.

Isolate Enzyme from Pineapple Peels, Cores

HONOLULU, T. H. — Bromelin has been successfully isolated from the peels and cores of pineapples by a procedure developed here.

Technique is said to consist of pressing the juice from the peels and cores at a stage of manufacture at which the juice is of little commercial value to the canner. The bromelin is precipitated from the juice by the addition of ethanol, which can be recovered for use with fresh batches of juice.

Bromelin is an enzyme which, like certain other members of this group, has the property of breaking down meat protein and thus making tough cuts more tender.

Films and Threads Formed From Ethylene Polymers

NORWICH, England — How films, tubes, and threads can be produced from ethylene polymers by precipitating them from solutions is described in a U.S. patent granted to two inventors here.

As a typical instance of the method, the patent cites the following procedure. An ethylene polymer is dissolved in xylene, and the solution is extruded under pressure into a bath, which may consist of butanol or of a mixture of normal amyl alcohol and butyl phthalate. A viscous thread is produced, which may be drawn off by means of a reel.

Testosterone Ethyl Carbonate

Testosterone ethyl carbonate can be produced by reacting testosterone with ethyl chloroformate, it is revealed in a recently issued Swiss patent.

Ethyl chloroformate is produced by U.S.I.

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July ★ **U.S.I. CHEMICAL NEWS** ★ 1942

Obtain Better Yield Of Alpha-Amino Acids With New Procedure

Recently reported investigations of methods for the synthesis of alpha-amino acids indicate that purer compounds and higher yields can be obtained by modification of the Bouveault procedure involving the nitrosation of acetoacetic esters to form alpha-oximino acids.

Method of Procedure

In the modified procedure, appropriately substituted acetoacetic esters were dissolved in 85% sulfuric acid and treated at temperatures below 0° C. with an alkyl nitrite. Alpha-oximino esters were produced by these reactions. Reduction of the oximino acids (or esters) to the corresponding primary amino acids (or esters) was carried out using hydrogen at 10 atmospheres pressure with palladinized charcoal as catalyst. This hydrogenation proceeded satisfactorily and the amino acids were isolated in good yields. Typical equations for the reactions are shown in the box at the bottom of this column.

Acids Synthesized

Alanine, alpha-aminobutyric acid, norvaline, norleucine, isoleucine, aspartic acid, phenylalanine, and O-methyltyrosine were synthesized in these studies. The O-methyltyrosine was demethylated and converted into tyrosine. It appears likely, as a result of these investigations, that any monosubstituted acetoacetic ester may be successfully converted into an alpha-amino acid by an application of these reactions.

The substituted acetoacetic esters may be conveniently prepared by familiar methods from ethyl acetoacetate, a U.S.I. product of which adequate supplies are available at the present time, though they may be subject to future limitation.

Butanol Now Under Complete Allocation

Effective July 1, butanol was placed under complete allocation control. Under the terms of an order issued by the War Production Board, purchasers will apply for allocations on Form PD-505. Deliveries to persons using less than 54 gallons a month are permitted under certain conditions without allocation.

Ethyl Sodium Oxalacetate

(*Continued from previous page*)

ester, dioxopyrrolidine carboxylic acids are formed.

3. Although urea is a primary amine, its condensation with ethyl oxalacetate is of interest because both amino groups take part in the reaction; the product being the ethyl uracil-4-carboxylate. The free acid itself melts at 347° C. and is so stable that up to 185° to 205° C., 20% sulfuric acid has no effect on it, while evaporation to dryness with fuming nitric acid leaves it unchanged. This extreme stability may indicate some potential commercial use.

4. In the presence of pyridine, ethyl oxalacetate and ethyl cyanoacetate form triethyl cyanoaconitate.

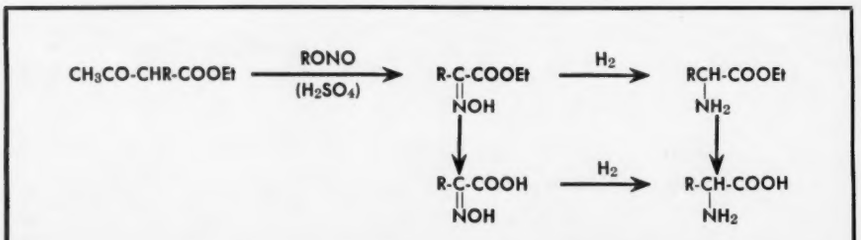
5. With hydrochloric acid, oxalacetic ester is converted into derivatives of alpha-pyrone.

6. According to an abstract of an article by a recent investigator, oxalacetic acid is reduced by yeast to malic acid.

7. In the presence of piperidine or diethyl amine, 2 molecules of oxalacetic ester condense with one molecule of an acyclic aldehyde.

8. Acetic anhydride and oxalacetic ester form ethyl acetoxyfumarate.

9. Heated to 250-350° C., oxalacetic ester loses carbon monoxide and forms ethyl malonate. (British Patent 228,863)



Typical equations for preparation of alpha-amino acids from substituted acetoacetic esters.

TECHNICAL DEVELOPMENTS

Further information on these items may be obtained by writing to U.S.I.

A metal lead primer is described as being equal in its protective value to a good grade of aluminum paint. Maker says that it adheres tightly to metal under rapid climatic changes, is resistant to salt air, and will not bleed through the finishing coat. **(No. 590)**

U S I

A new alkaline cleaner is reported to clean aluminum rapidly and effectively without building up an oxide coating. It is described as suitable for the removal of lubricating oils and also of zinc chromate primer and lacquer coats. **(No. 591)**

U S I

A new coating for metals is said to result in a substantial increase in the life of paint films applied over it. Maker says that it is corrosion-inhibiting, and that it also removes rust and oil from the metal. It can be used on galvanized sheets, and has been suggested as a possible substitute for tin plating. **(No. 592)**

U S I

A plastic molding powder is reported to be intended for use at temperatures down to −94° F., and to be flexible, shock-resistant, and dimensionally stable at this temperature. Material is said to be odorless, tasteless, non-toxic, and water-resistant. **(No. 593)**

U S I

Industrial gloves are made of fabric treated with synthetic rubber to form an exterior coating that is said to be flexible, liquid-proof, and not subject to snagging. According to the maker, the synthetic rubber is resistant to attack by oil, solvents, acids, alkalis, and abrasion. **(No. 594)**

U S I

A new dispersion process is said to produce complete, homogeneous mixtures of solids and liquids. Compressed air is used to inject streams of solids and liquids from separate storage tanks into a mixing chamber, where the substances are intimately mixed by the turbulence of the released compressed air. **(No. 595)**

U S I

Alpha-chloropropionic acid is now available in limited quantities for research investigation, it has been announced. It is described as a colorless liquid infinitely soluble in water, acetone, and ether. **(No. 596)**

U S I

A Japan wax substitute is now in production in this country, it has been announced. It is reported that the new material displays many of the physical and chemical properties of the imported product. **(No. 597)**

U S I

A multi-point pH recorder provides a permanent record on a single chart of the conditions at a number of different sampling points, it is reported. For example, the instrument may be used to record the pH of a liquid before and after it passes a point at which some form of treatment is applied. **(No. 598)**

U S I

A pour point depressant is described as a synthetic material closely resembling a petroleum lubricant in physical properties. It is said to enable refiners of wax-bearing crudes to produce low pour-test oils more economically by avoiding the expense of dewaxing at extremely low temperatures. **(No. 599)**

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★ ★ ★

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Our Ozalid machine for the swift reproduction to scale of engineering drawings and other records . . . is being manufactured in volume for use by Government agencies and by companies serving the Government. The savings in costs and time made possible by the Ozalid machine are notable.

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PRICES CURRENT

Chemical prices quoted are of American manufacturers for spot New York, immediate shipment, unless otherwise specified. Products sold f.o.b. works are specified as such. Import chemicals are so designated.

Oils are quoted spot New York, ex-dock. Quotations f.o.b. mills, or for spot goods at the Pacific Coast are so designated.

Raw materials are quoted New York, f.o.b., or ex-dock. Materials sold f.o.b. works or delivered are so designated.

The current range is not "bid and asked," but are prices from different sellers, based on varying grades or quantities or both.

Purchasing Power of the Dollar: 1926 Average—$1.00 - 1940 Average $1.20 - Jan. 1941 $1.16 - June 1942 $0.93

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Acetaldehyde, 99%, 55, 110 gal drs, wks ....lb.	...	.11	.11	.11	.11
Acetaldol (Aldol), 55, 110 gal drs, c-l, wks ....lb.	...	.12	.12	.11	.13
Acetamide, tech, kgs, wks .lb.	.28	.50	.28	.50	.28	.45
Acetanilid, tech, cryst, bbls ....lb.	.29	.31	.29	.31	.29	.31
powd, bbls ....lb.	.27	.29	.27	.29	.27	.29
Acetic Anhydride, drs, c-l, frt all'd ....lb.	.11½	.13	.11½	.13	.10½	.13
Acetin, tech, lcl drs ....lb.	...	.29	.29	.29	.29	.33
Acetone, tks, delv (*PC*) ..lb.	.07	.158	.07	.158	.06	.158
drs, c-l, delv (*PC*) ....lb.	.08½	.168	.08½	.173	.07½	.173
Acetonitrile, drs, wks ...lb.	1.00	2.00	1.00	2.00	1.00	2.00
Acetophenone, drs ....lb.	1.55	1.60	1.55	1.60	1.55	1.60
Acetophenetidin, bbls, kgs, 1000 lbs ....lb.	...	1.00	1.00	1.00	1.00	1.00
ACIDS						
Acetic, 28%, bbls (*PC*) 100 lbs.	3.38	3.63	3.38	3.63	2.23	3.43
glacial, nat, bbls ..100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
synth, drs ....100 lbs.	9.15	9.40	9.15	9.40	7.62	8.55
tks, wks ....100 lbs.	6.25	6.93	6.25	6.93	...	...
Acetylsalicylic, USP, (*PC*) special, 200 lb bbls ....lb.	...	.45	.45	.45	.45	.45
Standard USP ....lb.	...	.40	.40	.40	.40	.40
Adipic, fib drs, wks ....lb.	...	.31	.31	.31	.31	.31
Anthranilic, ref'd bbls ...lb.	1.20	1.25	1.20	1.25	1.15	1.20
tech, bbls ....lb.	...	.95	.95	.95	.75	.95
Ascorbic, bots, drs (*PC*) oz.	1.50	1.70	1.50	1.85	1.85	2.10
Battery, cbys, wks ..100 lbs.	1.60	2.55	1.60	2.55	1.60	2.55
Benzoic, tech, bbls ....lb.	.43	.47	.43	.47	.43	.47
USP, bbls ....lb.	.54	.59	.54	.59	.54	.59
Boric, tech, gran, frt all'd bgs 40 tons ....ton *a*	...	99.00	99.00	99.00	93.50	99.50
bbls ....ton *a*	...	109.00	108.00	109.00	108.00	108.00
Broenner's, bbls ....lb.	...	1.11	1.11	1.11	1.11	1.11
Butyric, c-l drs, wks ....lb.	...	.22	.22	.22	.22	.22
tks, wks ....lb.	...	.21	.21	.21	.21	.21
Caproic, drs, wks ....lb.	...	.35	.25	.35	.25	.30
Chlorosulfonic, drs, wks ..lb.	.03	.04½	.03	.04½	.03½	.05
tks, wks ....lb.	...	.02½	.02½	.02½	...	...
Chromic, drs (*FP*) ....lb.	.16¼	.18¼	.16¼	.18¼	.15¼	.17¼
Citric, crys, gran, bbls ..lb. *b*	.20	.21	.20	.21	.20	.21
Anhyd gran, drs (*PC*) lb.	.22½	.26½	.22½	.26½	.23	.26½
Cleve's bbls ....lb.	...	.65	.65	.65	.65	.65
Cresylic 50%, 210-215° HB, drs, wks, frt equal (A) gal.	.81	.83	.81	.86	.76	.84
Low Boiling ....gal.	.81	.83	.81	.86	.76	.84
Formic, tech, cbys ....lb.	.10½	.11½	.10½	.11½	.10½	.11½
Fumaric, bbls ....lb.	.27	.31	.27	.31	.24	.29
Gallic, tech, bbls ....lb.	1.10	1.12	1.10	1.13	.90	1.13
NF bbls ....lb.	1.27	1.30	1.27	1.30	1.10	1.30
H, bbls wks ....lb.	...	.45	.45	.45	.45	.45
Hydrochloric, see muriatic						
Hydrocyanic cyls, wks ...lb.	.80	1.00	.80	1.00	.80	1.00
Hydrofluoric, 30%, bbls, wks ....lb.	.06	.06½	.06	.06½	.06	.06½
Hydrofluosilic, 35%, bbls lb.	.09	.09½	.09	.09½	.09	.09½
Lactic, 22% dark, bbls ...lb.	.029	.0315	.029	.035	.02½	.035
22%, light, bbls wks ...lb.	.039	.0415	.039	.0415	.03½	.0415
44%, dark, bbls wks ...lb.	.063	.0655	.063	.0655	.05½	.0655
44%, light, bbls wks ...lb.	.073	.0755	.073	.0755	.06½	.073
Lauric, dist, tech, drs ....lb.	.20	nom.	.20	.20½	.15	.18¾
Laurent's bbls ....lb.	...	.45	.45	.45	.45	.45
Maleic, powd, drs ....lb.	...	.30	.30	.30	.30	.30
Anhydride, drs ....lb.	.25	.26	.25	.26	.25	.26
Malic, powd, kgs ....lb.	...	.47	.47	.47	.47	.47
Mixed, tks N unit ....lb.	.05	.06	.05	.06	.05	.06
S unit ....lb.	.0085	.009	.0085	.009	.0085	.009
Molybdic, kgs, wks ....lb.	.95	1.10	.95	1.10	.95	1.10
Monochloracetic, tech, bbls ....lb.	...	.17	.17	.17	.15	.18
Monosulfonic, bbls ....lb.	...	1.50	1.50	1.50	1.50	1.50
Muriatic, 18° cbys, c-l wks ....100 lb.	...	1.50	1.50	1.50	1.50	1.50
tks, wks ....100 lb.	...	1.05	1.05	1.05	1.05	1.05
20°cbys, c-l, wks ..100 lb.	...	1.75	1.75	1.75	1.75	1.75
tks, wks ....100 lb.	...	1.15	1.15	1.15	1.15	1.15
22° cbys, c-l, wks ..100 lb.	...	2.25	2.25	2.25	2.25	2.25
tks, wks ....100 lb.	...	1.65	1.65	1.65	1.65	1.65
Acid (continued): CP cbys ....lb.	.06½	.08	.06½	.08	.06½	.08
Myristic, dist, drs ....lb.	.19	.19½	.18	.19½	.18	.18½
Naphthenic drs, 220-230 ..lb.	...	.13	.10	.13	.10	.10
tks, wks (A) ....lb.	...	.10	.09	.10	.09	.09
Naphthionic, tech, bbls ...lb.	.60	.65	.60	.65	.60	.65
Nicotinic cns ....lb.	...	6.96	6.96	7.15	7.15	7.15
Nitric, 36°, cbys, c-l, wks ....100 lbs. *c*	...	5.00	5.00	5.00	5.00	5.00
38°, c-l, cbys, wks 100 lbs. *c*	...	5.50	5.50	5.50	5.50	5.50
40°, c-l, cbys, wks 100 lbs. *c*	...	6.00	6.00	6.00	6.00	6.00
42°, c-l, cbys, wks 100 lbs. *c*	...	6.50	6.50	6.50	6.50	6.50
CP, cbys ....lb.	.11½	.13	.11½	.13	.11½	.13
Oxalic, bbls, wks (*PC*) ..lb.	.11¼	.12½	.11¼	.14½	.11½	.14¼
Phosphoric, 85% USP, cbys ....lb.	...	.12	.12	.12	.12	.12
50% food grade, c-l, bbls, wks, frt equal ..100 lbs.	4.00	4.25	4.00	4.25	4.00	4.25
Picramic, kgs ....lb.	.65	.70	.65	.70	.65	.70
Picric, bbls, wks ....lb.	...	.35	.35	.35	.35	.35
Propionic, pure, drs, wks lb.	...	.14	.14	.14	.14	.14
tks, wks ....lb.	...	.11	.11	.11	.11	.11
Pyrogallic, tech, lump, pwd, bbls ....lb.	...	1.45	1.45	1.45	1.45	1.45
USP, cryst, cns ....lb.	...	2.10	2.10	2.10	1.70	2.25
Pyroligneous, bbls, delv gal.	...	.25	.25	.25	.25	.25
Ricinoleic, tech, drs, wks lb.	.32	.37	.32	.37	.32	.37
Salicylic, tech, 125 lb bbls, wks (*PC*) ....lb.	...	.33	...	.33	...	.33
USP, bbls ....lb.	.35	.46	.35	.46	.35	.40
Sebasic, tech, bbls, wks ..lb.	...	.82	.82	.82	.82	.82
Stearic, see under Oils & Fats						
Succinic, bbls ....lb.	...	.75	...	.75	...	.75
Sulfanilic, 250 lb drs, wks lb.	...	.17	...	.17	...	.17
Sulfuric, 60°, tks, wks ..ton	...	13.00	...	13.00	...	13.00
c-l, cbys, wks ....100 lb.	...	1.25	...	1.25	...	1.25
66°, tks, wks ....ton	...	16.50	...	16.50	...	16.50
c-l, cbys, wks ....100 lb.	...	1.50	...	1.50	...	1.50
CP, cbys, wks ....lb.	.06½	.08	.06½	.08	.06½	.08
Fuming (Oleum) 20% tks, wks ....ton	...	19.50	...	19.50	18.50	19.50
Tannic, tech, 300 lb bbls ..lb.	.71	.73	.71	.73	.54	.73
Tartaric, USP, gran, powd, 300 lb bbls ....lb.	...	.70½	...	.70½	.46¼	.70½
Tobias, 250 lb bbls ....lb.	.55	.60	.55	.60	.55	.60
Trichloroacetic bottles ...lb.	2.00	2.50	2.00	2.50	2.00	2.50
Tungstic, pure 100 lb. pkg. (A) ....lb.	...	2.86	...	2.86	no prices	
Acrylonitrile, tks ....lb.	...	.34	.34	.34	...	...
Albumen, light flake, 225 lb bbls ....lb.	...	.65	.65	.75	.55	.75
dark, bbls ....lb.	...	.13½	.12½	.14	.13	.18
egg, edible ....lb.	1.73	1.78	1.73	1.85	.65	1.85
Alcohol, Amyl (from Pentane) tks, delv ....lb.	...	.131	...	.131	.111	.131
c-l, drs, delv ....lb.	...	.141	...	.141	.121	.141
lcl, drs, delv ....lb.	...	.151	...	.151	.131	.151
Amyl, normal lcl drs Wyandotte, Mich. ....lb.	...	.27	.27	.42	.25	.27
secondary, tks, delv ....lb.						
drs, c-l, delv E of Rockies ....lb.	...	.09½	...	.09½	...	.09½
tertiary, rfd, lcl, drs, f.o.b., Wyandotte, frt all'd ....lb.	...	.09	...	.09	...	.09
Benzyl, cans ....lb.	.65	.75	.65	.75	.65	.75
Butyl, normal, tks, f.o.b. wks, frt all'd (*PC*) (A) ....lb.	.13½	.168	.12½	.168	.09	.158
c-l, drs, f.o.b. wks, frt all'd ....lb.	.14	.173	.13½	.173	.10	.168
Butyl, secondary, tks, delv ....lb.	...	.08½	...	.08½	.07¼	.08½
c-l, drs, delv ....lb.	...	.09½	...	.09½	.08¼	.09½
Butyl, tert denat c-l drs lb.	...	.12½	...	.12½	...	.12½
lcl drs ....lb.	...	.13	...	.13	...	.13
tks ....lb.	...	.11½	...	.11½	...	.11½
Capryl, drs, crude, wks lb.	...	.16	...	.16	...	.16
Cinnamic, bottles ....lb.	3.00	3.60	3.00	3.60	2.33	3.60
Denatured, CD, 14, c-l drs, wks (*PC*, *FP*) gal.	...	.65	...	.65	.36½	.45½
tks, East, wks ....gal.	...	.58	...	.58	.26½	.58
Denatured, SD, No. 1, tks,	...	.53	...	.53	.28½	.53

a Powdered boric acid $5 a ton higher; USP $25 higher; *b* Powdered citric is ½c higher; kegs are in each case ½c higher than bbls; Prices are f.o.b. N. Y., Chicago, St. Louis, deliveries ½c higher than NYC prices; *y* Price given is per gal.

(*A*) Allocations. (*FP*) Under full priority control. (*PC*) Under price ceiling.

c Yellow grades 25c per 100 lbs. less in each case. *d* Prices given are Eastern schedule; Territories other east of Rockies and 15½c per gal. less than Eastern Works price.

ABBREVIATIONS—Anhydrous, anhyd; bags, bgs; barrels, bbls; carboys, cbys; carlots, c-l; less-than-carlots, lcl; drums, drs; kegs, kgs; powdered, powd; refined, ref'd; tanks, tks; works, f.o.b., wks.

Church & Dwight Co., Inc.

Established 1846

70 PINE STREET NEW YORK

Bicarbonate of Soda

Sal Soda

Monohydrate of Soda

Standard Quality

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Alcohols (continued):						
Diacetone, pure, c-l drs, delv	lb. *f*	.11½	.14½	.11½	.14½	.09½	.13
tks, delv	lb.	.10½	.13½	.10½	.13½	.10½	.13½
tech, contract, drs, c-l, delv	lb.	.11	.13½	.11	.13½	.09	.12
tks, delv	lb.	.10	.12½	.10	.14	.10	.12½
Ethyl, 190 proof molasses, tks	gal. *g*	...	8.12	...	8.12	5.96½	8.12
c-l, drs	gal. *g*	...	8.19	...	8.19	6.02½	8.19
c-l, bbls	gal. *g*	...	8.25½	...	8.25½	6.03½	8.25
Furfuryl, tech, 500 lb. drs	lb.	.20	.35	.20	.35	.20	.25
Hexyl, secondary tks, delv	lb.	...	.23	...	.23	.12	.23
c-l, drs, delv	lb.	...	.24	...	.24	...	.13
Isoamyl, prim, cans, wks	lb.	...	.32	...	.32	...	.32
drs, lcl, delv	lb.	...	.22½	...	.22½	.22½	.27
Isobutyl, ref'd, lcl, drs	lb.	...	.086	...	.086	.079	.086
c-l, drs	lb.	...	.076	...	.076	.069	.076
tks	lb.	...	.076	...	.076	.069	.076
Ethylhexyl, tks, wks	lb.	.23	.25	.23	.25	.23	.23
Isopropyl, ref'd, 91% drs, frt all'd	gal.	.40½	.43½	.40½	.43½	.40½	.43½
tks, frt all'd	gal.	...	.34	.34	.34	.34	.34
99%, drs, frt all'd	gal.	.44	.47	.44	.47	.44	.47
tks, frt all'd	gal.	...	.37½	.37½	.37½	.37½	.37½
Octyl, see Ethylhexyl							
Polyvinyl A fib drs	lb.	...	.65	.54	.65	.26	.54
B fib drs	lb.	.60	.65	.60	.70	...	...
Propyl, nor, drs, wks	gal.	.67	.70	.69	.75	...	...
Spec Solvents, East, drs, wks	gal.	...	.61	.61	.70	...	...
tks, East, wks	gal.	...	.54	.54	.66	...	...
Tetrahydrofurfuryl drs, f.o.b. wks	lb.	.44	.50	.44	.50	...	...
Aldehyde ammonia, 100 gal drs	lb.	.65	.70	.65	.70	.65	.70
Aldehyde Bisulfite, bbls, delv	lb.	...	.17	...	.17	...	.17
Aldol, 95%, 55 and 110 gal, drs, delv	lb.	.12	.15	.12	.15	.11	.15
Alphanaphthol, crude, 300 lb bbls	lb.	...	.52	...	.52	...	.52
Alphanaphthylamine, 350 lb bbls	lb.	...	.32	...	.32	...	.32
Alum, ammonia, lump, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
delv NY, Phila	100 lb.	...	4.25	...	4.25	3.75	4.25
Granular, c-l, bbls wks	100 lb.	...	4.00	...	4.00	3.50	4.00
Powd, c-l, bbls, wks	100 lb.	...	4.40	...	4.40	3.90	4.40
Potash, lump, c-l, bbls, wks	100 lb.	...	4.50	...	4.50	4.00	4.50
Granular, c-l, bbls, wks	100 lb.	...	4.25	...	4.25	3.75	4.25
Powd, c-l, bbls, wks	100 lb.	...	4.65	...	4.65	4.15	4.65
Soda, bbls, wks	100 lb.	...	3.25	...	3.25	...	3.25
Chrome, bbls	100 lb.	.12½	.15	.12½	.15	no prices	
Aluminum metal, c-l, (*FP*)	100 lb.	15.00	16.00	15.00	16.00	17.00	18.00
Acetate, 20%, nor sol, bbls	lb.	.09½	.10½	.09½	.11	.10½	.11
Basic powd, bbls, delv	lb.	.40	.50	.40	.50	.35	.50
24% sol, bbls, delv	lb.	.10½	.11	.10½	.11	.09½	.12
Chloride anhyd 99% wks	lb.	.08	.12	.08	.12	.08	.12
Crystals, c-l, drs, wks	lb.	.06	.06½	.06	.06½	.06	.06½
Solution, drs, wks	lb.	.02¾	.03¼	.02¾	.03¼	.02¾	.03¼
Formate, 30% sol bbls, c-l, delv	lb.	.13	.15	.13	.15	.13	.15
Hydrate, 96%, light, 90 lb. bbls, delv	lb.	...	.14½	...	.14½	.12½	.14½
heavy, bbls, wks	lb.	...	.034	...	.034	.029	.03½
Oleate, drs	lb.	...	.24½	.17½	.26	.17½	.20
Palmitate, bbls	lb.	.25	.26	.25	.26	.20½	.26
Resinate, pp., bbls	lb.	...	.15½	.15	.15½	...	.15
Stearate, 100 lb bbls	lb.	.23	.24	.22	.24	.18	.23
Sulfate, com, c-l, bgs, wks	100 lb.	1.15	1.25	1.15	1.25	1.15	1.25
c-l, bbls, wks	100 lb.	1.35	1.45	1.35	1.45	1.35	1.45
Sulfate, iron-free, c-l, bgs, wks	100 lb.	1.75	1.85	1.75	1.85	1.60	1.85
c-l, bbls, wks	100 lb.	1.95	2.05	1.95	2.05	1.80	2.10
Ammonia anhyd fert com, tks	lb.	.04½	.05	.04½	.05	.04½	.05
Ammonia anhyd, 100 lb cyl	lb.	...	.16	...	.16	...	.16
26°, 800 lb drs, delv	lb.	.02¼	.02½	.02¼	.02½	.02¼	.02½
Aqua 26°, tks, NH_3 cont.		...	.04	.04	.08z	.04	.05¼
Ammonium Acetate, kgs	lb.	.27	.33	.27	.33	.27	.33
Bicarbonate, bbls, f.o.b. wks	100 lb	.0564	.0614	.0564	.0614	.0564	.0614
Bifluoride, 300 lb bbls	lb.	.16	.18	.15½	.18	.14	.18
Carbonate, tech, 500 lb bbls	lb.	.08¾	.09¼	.08¾	.09¼	.08¾	.09¼
Chloride, White, 100 lb. bbls, wks	100 lb.	...	4.45	4.45	...	4.45	...
Gray, 250 lb bbls, wks	100 lb.	5.50	5.75	5.50	5.75	5.50	5.75
Lactate, 500 lb bbls	lb.	.15	.16	.15	.16	.15	.16
Laurate, bbls	lb.	...	.23	...	.23	...	.23
Linoleate, 80% anhyd, bbls	lb.	...	.12	...	.12	...	.12
Nitrate, tech, bgs, bbls	lb.	.0435	.0455	.0435	.0455	.0435	.0455
Oleate, drs	lb.	...	.14	...	.14	...	.14
Oxalate, neut, cryst, powd, bbls	lb.	.23	.29	.23	.29	.19	.29
Perchlorate, kgs (A)	lb.	.55	.65	.55	.65	.55	.65
Persulfate, 112 lb kgs	lb.	.25½	.28½	.21	.28½	.21	.22

z On a f.o.b. wks. basis.
(A) Allocation

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Ammonium (continued):						
Phosphate, diabasic tech, powd, 325 lb bbls	lb.	...	.07¼	.07¼	.09¼	.07¼	.09¼
Ricinoleate, bbls	lb.	...	.15	...	.15	...	.15
Stearate, anhyd, bbls	lb.	...	.24½	...	.24½	...	.25½
Paste, bbls	lb.	...	.06½	...	.06½	...	.06¼
Sulfate, dom, f.o.b., bulk	ton	29.00	30.00	29.00	30.00	29.00	30.00
Sulfocyanide, pure, kgs	lb.	.45	.55	.45	.55	.45	.65
Amyl Acetate (from pentane)							
tks, delv	lb.	...	.145	...	.145	.105	.145
c-l, drs, delv	lb.	...	.155	...	.155	.115	.155
lcl, drs, delv	lb.	...	.165	...	.165	.125	.165
tech drs, ex-fusel oil delv	lb.	...	.14½	...	.14½	...	.14½
Secondary, tks, delv	lb.	...	.08½	...	.08½	...	.08½
c-l, drs, delv	lb.	...	.09½	...	.09½	...	.09½
tks, delv	lb.	...	.08½	...	.08½	...	.08½
Chloride, norm, drs, wks	lb.	no prices		.56	.68	.56	.68
mixed l c l drs, wks	lb.	...	...	...	.08	.0565	.08
tks, wks	lb.	...	...	...	.06	.0465	.06
Amyl Ether (see Diamyl							
lcl, dms	lb.	...	.102	...	.102	...	...
cl, dms	lb.	...	.095	...	.095	...	...
tks	lb.	...	.085	...	.085	...	...
Mercaptan, drs, wks	lb.	...	1.10	...	1.10	...	1.10
Oleate, lcl, wks, drs	lb.	...	.31	...	.31	.25	.31
Stearate, lcl, wks, drs	lb.	...	.32½	...	.32½	.26	.335
Amylene, c-l, drs, f.o.b. wks,	lb.	...	.102	.102	.11	.102	.11
lcl, dms, f.o.b., wks		...	.11	...	.11	...	...
tks, f.o.b., wks	lb.	...	.09	...	.09	...	.09
Amylnaphthalenes, see Mixed Amylnaphthalenes							
Aniline Oil, 960 lb drs and tks	lb.	.12½	.16	.12½	.16	...	.14½
Annatto fine	lb.	.34	.39	.34	.39	.34	.39
Anthracene, 80-85%	lb.	...	.55	...	.55	...	.55
Anthraquinone, sublimed, 125 lb bbls	lb.	...	.70	...	.70	.65	.70
Antimony metal slabs, ton lots	lb.	...	.14½	.14	.14½	.14	.16½
Butter of, see Chloride							
Chloride, soln, cbys	lb.	...	.17	...	.17	...	.17
Needle, powd, bbls	lb.	.18½	.20	.18½	.20	.16	.18
Oxide, 500 lb bbls (A)	lb.	.15	.15½	.15	.16½	.12	.16½
Salt, 63% to 65%, drs	lb.	...	.40	.34	.40	.28	.34
Archil, conc, 600 lb bbls	lb.	...	.26	...	.26	no prices	
Aroclors, wks	lb.	.18	.30	.18	.30	.18	.30
Arrowroot, bbls	lb.	.09½	.09¾	.09½	.10¾	.09½	.10¾
Arsenic, Metal	lb.	no prices		no prices		no prices	
Red, 224 lb cs kgs	lb.	no prices		no prices		no prices	
White, 112 lb kgs. (A)	lb.	.04	.04¼	.04	.04¾	.03½	.04¼

B

Barium Carbonate precip, 200 lb bgs, wks	ton	55.00	65.00	55.00	65.00	45.00	65.00
Nat (witherite) 90% gr, c-l, wks, bgs	ton	...	43.00	...	43.00	...	43.00
Chlorate, 112 lb kgs, NY (A)	lb.	...	.60	...	.60	...	.45
Chloride, 600 lb bbls, delv, zone 1	ton	77.00	92.00	77.00	92.00	77.00	92.00
Dioxide, 88%, 690 lb drs	lb.	...	.10	...	.10	...	.10
Hydrate, 500 lb bbls	lb.	.06	.07	.06	.07	.05½	.07
Nitrate, bbls	lb.	.11	.12	.10½	.12½	.08½	.12½
Barytes, floated, 350 lb bbls c-l, wks	ton	...	27.65	...	27.65	25.15	27.65
Bauxite, bulk, mines	ton	7.00	10.00	7.00	10.00	7.00	10.00
Bentonite, c-l, 325 mesh, bgs, wks	ton	...	16.00	...	16.00	...	16.00
200 mesh	ton	...	11.00	...	11.00	...	11.00
Benzaldehyde, tech, 945 lb. drs, wks	lb.	.45	.55	.45	.55	.45	.55
Benzene (Benzol), 90%, Ind. 8000 gal tks, ft all'd	gal.	(A)	.15	...	.15	.14	.15
90% c-l, drs	gal.	...	.20	...	.20	.19	.20
Ind pure, tks, frt all'd	gal.	...	.15	...	.15	.14	.15
Benzidine Base, dry, 250 lb. bbls	lb.	...	.70	...	.70	...	.70
Benzoyl Chloride, 500 lb drs	lb.	.23	.28	.23	.28	.23	.28
Benzyl Chloride, 95-97% rfd, drs	lb.	.22	.24	.22	.24	.19	.24
Beta-Naphthol, 250 lb bbls, wks	lb.	.23	.24	.23	.24	.23	.24
Naphthylamine, sublimed, 200 lb bbls	lb.	...	1.25	1.25	...	1.25	1.35
Tech, 200 lb bbls	lb.	...	.51	...	.51	.51	.52
Bismuth metal	lb.	...	1.25	...	1.25	...	1.25
Chloride, boxes	lb.	...	3.00	...	3.00	3.00	3.25
Hydroxide, boxes	lb.	3.35	3.46	3.35	3.46	3.35	3.46
Oxychloride, boxes	lb.	3.10	3.19	3.10	3.19	3.10	3.19
Subbenzoate, fib dms	lb.	...	3.40	...	3.40	...	3.40
Subcarbonate, kgs	lb.	1.59	1.85	1.59	1.85	1.59	1.85
Subnitrate, fibre, drs	lb.	1.29	1.57	1.29	1.57	1.20	1.57
Trioxide, powd, boxes	lb.	...	3.65	...	3.65	...	3.65
Blanc Fixe, Pulp, 400 lb. bbls, wks	ton *h*	40.00	46.50	40.00	46.50	35.00	46.50
Bleaching Powder, 800 lb drs, c-l, wks, contract 100	lb.	2.25	3.10	2.25	3.10	2.00	3.10
lcl, drs, wks	lb.	2.50	3.35	2.50	3.35	2.25	3.35
Blood, dried, f.o.b., NY unit		5.45	5.50	5.25	5.50	4.75	5.25
Chicago, high grade	unit	5.65	5.70	5.40	5.80	5.00	5.40
Imported shipt	unit	...	5.50	5.00	5.50	4.75	5.00
Blues, Bronze Chinese Prussian Soluble	lb.	...	.36	...	.36	.33	.36
Milori, bbls	lb.	...	.36	...	.36	.33	.36

h Lowest price is for pulp, highest for high grade precipitated; *i* Crystals $6 per ton higher; USP, $15 higher in each case; * Freight is equalized in each case with nearest producing point.

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BOONTON, N. J. NEW YORK BOSTON CHICAGO

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Blues (continued):						
Ultramarine,* dry, wks, bbls	lb.	.12	.13	.11	.13	... .11
Regular grade, group 1	lb.	.17	.27	.16	.27	.16 .20
Pulp, Cobalt grade	lb.	.23	.27	.22	.27	.22 .24
Bone, 4½ + 50% raw, Chicago	ton	39.00	40.00	39.00	40.00	30.00 40.00
Bone Ash, 100 lb kgs	lb.	.06	.07	.06	.07	.06 .07
Meal, 3% & 50% imp	ton	...	37.50	...	37.50	31.50 37.50
Domestic, bgs, Chicago	ton	38.00	40.00	38.00	40.00	32.00 40.00
Borax, tech, gran, 80 and 40 ton lots, bgs, delv	ton	...	46.00	45.00	46.00	43.00 45.00
bbls, delv (*FP*)	ton	...	55.00	54.00	55.00	53.00 56.00
Tech, powd, 80 and 40 ton lots, bgs	ton	...	51.00	50.00	51.00	48.00 50.00
bbls, delv	ton	...	60.00	59.00	60.00	58.00 61.00
Bordeaux Mixture, drs	lb.	.11	.11½	.11	.11½	.11 .11½
Bromine, cases	lb.	.25	.30	.25	.30	.25 .30
Bronze, Al, pwd, 300 lb drs (*FP*)	lb.	...	.59	...	.59	... .57
Gold, blk	lb.	.60	.65	.60	.65	.60 .65
Butanes, com 16-32° group 3 tks (*PC*)	lb.	.02½	.03½	.02½	.03½	.02½ .03
Butyl, acetate, norm drs, frt all'd	lb.	.14½	.168	.14½	.168	.10 .168
tks, frt all'd	lb.	.13½	.158	.13½	.158	.09 .158
Secondary, tks, frt all'd	lb.	...	.08½	...	.08½	.07¼ .08½
drs, frt all'd	lb.	...	.09½	...	.09½	.08¾ .09½
Aldehyde, 50 gal drs, wks	lb.	.14½	.16½	.14½	.17½	.15½ .17½
Carbinol, norm (see Normal Amyl Alcohol)						
Chloride, normal lcl, drs	lb.	...	.35	.28	.35	... ...
c-l, drs	lb.	...	.32	.25	.32	... ...
Crotonate, norm, 55 and 110 gal drs, delv	lb.	...	.35	...	.35	... .35
Lactate	lb.	...	.26½	...	.26½	... .23½
Oleate, drs, frt all'd	lb.	...	.25	...	.25	... .25
Propionate, drs	lb.	.16½	.17	.16½	.17	.16½ .17
tks, delv	lb.	...	.15½	...	.15½	... .15½
Stearate, 50 gal drs	lb.	...	.31	...	.31	.28½ .32½
Tartrate, drs	lb.	no prices		no prices		.55 .60
Butyraldehyde, drs, lcl, wks	lb.	...	.35½	...	.35½	... .35½
C						
Cadmium Metal (*PC*)	lb.	.90	.95	.90	.95	.80 .95
Sulfide, orange, boxes	lb.	...	1.10	...	1.10	... 1.10
Calcium, Acetate, 150 lb bgs c-l, delv	100 lb.	3.00	4.00	3.00	4.00	1.90 4.00
Arsenate, c-l, E of Rockies, dealers, drs	lb.	.07	.08	.06½	.08	.06 .07½
Carbide, drs	lb.	...	.04¾	...	.04¾	... .04¾
Carbonate, tech, 100 lb bgs, c-l	ton	16.00	20.00	16.00	20.00	16.00 20.00
Chloride, flake, 375 lb drs, burlap bgs, c-l, delv	ton	...	21.00	...	21.00	... 20.50
paper bgs, c-l, delv	ton	18.50	41.00	18.50	41.00	18.50 35.00
Solid, 650 lb drs, c-l, delv	ton	18.00	34.50	18.00	34.50	18.00 34.50
Ferrocyanide, 350 lb bbls wks	lb.	...	.20	...	.20	... .20
Gluconate, Pharm, 125 lb bbls	lb.	.52	.59	.52	.59	.52 .59
Levulinate, less than 25 bbl lots, wks	lb.	...	3.00	...	3.00	... 3.00
Nitrate, 100 lb bgs	ton	no prices		no prices		no prices
Palmitate, bbls	lb.	.28	.29	.28	.29	.22 .29
Phosphate, tribasic, tech, 450 lb bbls	lb.	.0635	.0705	.0635	.0705	.0635 .0705
Resinate, precip, bbls	lb.	.15	.16	.13	.16	.13 .14
Stearate, 100 lb bbls	lb.	.26	.27	.26	.27	.20½ .27
Camphor, slabs	lb.	1.60	1.65	1.60	1.65	.73 1.65
Powder	lb.	1.60	1.65	1.60	1.65	.63 1.65
Carbon Bisulfide, 500 lb drs	lb.	.05	.05¾	.05	.05¾	.05 .05¾
Black, c-l, bgs, f.o.b. plants	lb.	...	.03625	...	.03625	.03325 .0342
Decolorizing, drs, c-l	lb.	.08	.15	.08	.15	.08 .15
Dioxide, Liq, 20-25 lb cyl	lb.	.06	.08	.06	.08	.06 .08
Tetrachloride, (*FP*) (*PC*) 55 or 110 gal drs, c-l, delv	lb.	...	.73	...	.73	.66½ .73
Casein, Standard, Dom, grd	lb.	.15	...	.15	.30½	.11½ .31
80-100 mesh, c-l bgs	lb.	.15½	...	.15½	.31	.12 .31½
Castor Pomace, 5½ NH_3, c-l, bgs, wks (*PC*)	ton	...	19.00	16.00	19.00	15.00 16.00
Imported, ship, bgs	ton	no prices		no prices		no prices
Celluloid, Scraps, ivory cs	lb.	.13	.15	.13	.15	.12 .15
Transparent, cs	lb.	...	.20	...	.20	... .20
Cellulose, Acetate, frt all'd, 50 lb kgs	lb.	...	.30	...	.30	... .30
Triacetate, flake, frt all'd	lb.	...	.30	...	.30	... .30
Chalk, dropped, 175 lb bbls	lb.	...	.02½	...	.02½	.02¼ .02½
Precip, heavy, 560 lb cks	100 lbs.	...	32.50	32.50	32.50	32.50 32.50
Charcoal, Hardwood, lump, blk, wks	bu.	...	.15	...	.15	... .15
Softwood, bgs, delv*	ton	25.00	36.00	25.00	36.00	25.00 36.00
Willow, powd, 100 lb bbls, wks	lb.	.06	.07	.06	.07	.06 .07
Chestnut, clarified tks, wks	lb.	...	.0225	...	.0225	.01¼ .0275
25%, bbls, wks	lb.	...	.0275	...	.0275	.0240 .0275
China Clay, c-l, blk mines	ton	...	7.60	...	7.60	... 7.60
Imported, lump, blk	ton	19.00	24.00	18.60	24.00	18.60 ...

j A delivered price; * Depends upon point of delivery.
(*FP*) Full Priority. (*PC*) Price Ceiling.
(A) Allocation

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Chlorine, cyls, lcl, wks, contract (*FP*) (A)	lb.	...	.07¼	...	.07¼	... .07¼
cyls, c-l, contract	lb.	...	.05¼	...	.05¼	... .05¼
Liq, tk, wks, contract	100 lb.	...	1.75	...	1.75	... 1.75
Multi, c-l, cyls, wks, cont	lb.	...	2.00	...	2.00	1.90 2.00
Chloroacetophenone, tins, wks	lb.	3.00	3.50	3.00	3.50	3.00 3.50
Chlorobenzene, Mono, 100 lb. drs, lcl, wks	lb.	...	.08	...	.08	.06 .08
Chloroform, tech, 650 lb drs	lb.	...	.20	...	.20	... .20
USP, 650 lb drs	lb.	...	.30	...	.30	... .30
Chloropicrin, comml cyls	lb.	...	.80	...	.80	... .80
Chrome, Green, CP	lb.	.23	.33	.23	.33	.21 .25
Yellow	lb.	.16	.17	.16	.17	.13½ .14½
Chromium Acetate, 8% Chrome, bbls	lb.	.07¾	.08½	.07¾	.08½	.07¾ .08½
Fluoride, powd, 400 lb bbls	lb.	.27	.28	.27	.28	.27 .28
Coal tar, bbls	bbl.	7.50	7.75	7.50	7.75	7.50 7.75
Cobalt Acetate, bbls (A)	lb.	...	.83¾	...	.83¾	.80½ .83¾
Carbonate tech, bbls (A)	lb.	...	1.58	...	1.58	... 1.58
Hydrate, bbls (A)	lb.	...	2.04	...	2.04	1.98 2.04
Linoleate, solid, bbls	lb.	...	.44	.42	.44	.33 .42
paste, 5%, drs	lb.	.32	.35	.31	.35	... .31
Oxide, black, bgs (A)	lb.	...	1.84	...	1.84	... 1.84
Resinate, fused, bbls	lb.	...	.15	.13½	.15	... .13½
Precipitated, bbls	lb.	...	.38	.34	.38	... .34
Cochineal, gray or bk bgs	lb.	.37	.38	.37	.38	.37 .38
Teneriffe silver, bgs	lb.	.38	.39	.38	.39	.38 .39
Copper, metal *FP*, *PC*	100 lb.	12.00	12.50	12.00	12.50	12.00 12.50
Acetate, normal, bbls, delv	lb.	.24	.26	.24	.26	.22 .26
Carbonate, 52-54% 400 lb bbls	lb.	.18	.20½	.18	.20½	.1650 .20½
Chloride, 250 lb bbls	lb.	...	.23¼	.19½	.23¼	.16 .19½
Cyanide, 100 lb drs	lb.	.34	.38	.34	.38	.34 .38
Oleate, precip, bbls	lb.	.22	.29½	.20	.29½	... .20
Oxide, black, bbls, wks	lb.	.19½	.21	.19½	.21	.18 .21
red 100 lb bbls	lb.	.20	.22	.20	.22	.19 .22
Sub-acetate verdigris, 400 lb bbls	lb.	.18	.19	.18	.19	.18 .19
Sulfate, bbls, c-l, wks, 100 lb.		5.15	5.50	5.15	5.50	4.75 5.50
Copperas crys and sugar bulk c-l, wks	ton	...	17.00	...	17.00	14.00 17.00
Corn sugar, tanners, bbls	100 lb.	...	3.54	3.54	4.05	3.36 4.05
Corn Syrup, 42°, bbls	100 lb.	...	3.69	3.52	3.69	3.42 3.52
43°, bbls	100 lb.	...	3.74	3.57	3.74	3.47 3.57
Cotton, Soluble, wet 100 lb bbls	lb.	.40	.42	.40	.42	.40 .42
Cream Tartar, powd & gran 300 lb bbls	lb.	...	.57½	...	.57½	.38¼ .57½
Creosote, USP 42 lb cbys	lb.	.60	.77	.60	.77	.45 .77
Oil, Grade 1 tks	gal.	...	.15½	...	.15½	.13½ .15½
Grade 2	gal.	.122	.132	.122	.132	.122 .132
Cresol, USP, drs, c-l (A)	lb.	.10¾	.11¼	.10¾	.11½	.09¾ .11¼
Crotonaldehyde, 97%, 55 and 110 gal drs, wks	lb.	...	.15	...	.15	.11 .15
Cutch, Philippine, 100 lb bale	lb	no supplies		...	.05¼	.04¾ .05¼
Cyanamid, pulv, bgs, c-l, frt (A) all'd, nitrogen basis, unit		1.52½ nom.		no prices		... 1.40
D						
Derris root 5% rotenone, bbls	lb.	...	.35	.40	.45	.21 .40
Dextrin, corn, 140 lb bgs f.o.b., Chicago	100 lb.	...	4.00	...	4.00	3.80 4.00
British Gum, bgs	100 lb.	...	4.25	...	4.25	4.05 4.25
Potato, Yellow, 220 lb bgs	lb.	...	.10	.09½	.10	.08 .08½
White, 220 lb bgs, lcl	lb.	.09½	.11¾	.09½	.11¾	.08½ .09
Tapioca, 200 bgs, lcl	lb.	...	.0715	...	.0715	... .0715
White, 140 lb bgs	100 lb.	...	3.95	...	3.95	3.75 3.95
Diamylamine, c-l, drs, wks	lb.	...	.61	.50	.61	.47 .50
lcl drs, wks	lb.	...	.64	.53	.64	.48 .53
Diamylene, drs, wks	lb.	...	.105	...	.105	.095 .105
lcl, drs	lb.	...	.112	...	.112	... ...
tks, wks	lb.	...	.09½	...	.09½	.08½ .09½
Diamylether	lb.	...	...	...	...	.085 .102
lcl, drs	lb.	...	.112	.102	.112	... ...
c-l, drs	lb.	...	.105	.095	.105	... ...
tks	lb.	...	.095	.085	.095	... ...
Diamylnaphthalene, lcl, drs, f.o.b. wks	lb.	...	.17	...	.17	.17 .20
Diamylphenol, lcl, drs	lb.	...	.21	...	.21	... ...
Diamylphthalate, drs, wks	lb.	...	.22	.21	.22	.21 .21½
Diamyl Sulfide, drs, lcl	lb.	...	.25	...	.25	... ...
Diatomaceous Earth, see Kieselguhr.						
Dibutoxy Ethyl Phthalate, drs, wks	lb.	...	.35	...	.35	... .35
Dibutylamine, lcl, drs, wks	lb.	...	.64	.53	.64	... .53
c-l, drs, wks	lb.	...	.61	.50	.61	... .50
tks, wks	lb.	...	.59	.48	.59	... .48
Dibutyl Ether, drs, wks, lcl	lb.	.26	.28	.26	.28	.25 .28
Dibutylphthalate, drs, wks, frt all'd	lb.	.21	.23½	.21	.23½	.19 .20
Dibutyltartrate, 50 gal drs	lb.	...	.92	.87	.92	.50 .87
Dichlorethylene, drs	lb.	...	.25	...	.25	... .25
Dichloroethylether, 50 gal drs, wks	lb.	.15	.16	.15	.16	.15 .16
tks, wks	lb.	...	.14	...	.14	... .14
Dichloromethane, drs, wks	lb.	...	.23	...	.23	... .23
Dichloropentanes, c-l, drs	lb.	...	.037	...	.037	.025 .04
lcl, drs	lb.	...	.045	...	.045	... ...
tks, wks	lb.	...	.03	...	.03	.0221 .025

* These prices were on a delivered basis.

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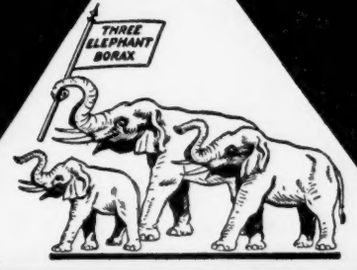

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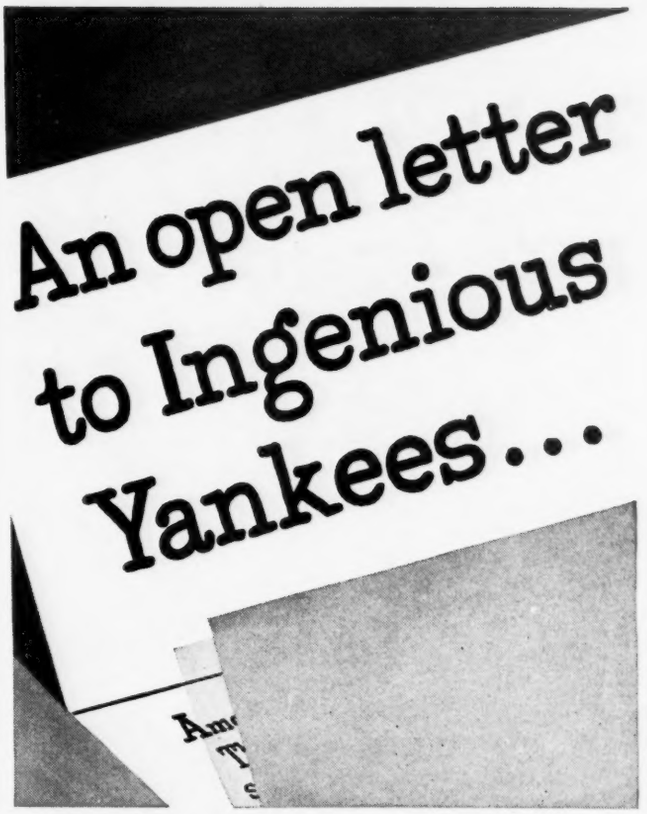
	Current Market	1942 Low	1942 High	1941 Low	1941 High
Diethanolamine, tks ,wks lb.	...	.22½	...	.22½	...	.22½
Diethylamine, 300 lb drs, lcl, f.o.b., wks .....lb.	...	.81	.70	.81	...	.70
Diethylamino Ethanol, lcl, drs, f.o.b. Wyandotte, frt all'd E. Miss .....lb.	...	.85	.75	.85	...	.75
Diethylaniline, 850 lb drs lb.	...	.40	...	.40	...	.40
Diethylcarbonate, com drs lb.	...	.25	...	.25	...	.25
Diethylorthotoluidin, drs ..lb.	.64	.67	.64	.67	.64	.67
Diethylphthalate, c-l, drs ..lb.	...	.22	.21½	.22	.19	.20
Diethylsulfate, tech, drs, wks, lcl .....lb.	.13	.14	.13	.14	.13	.14
Diethyleneglycol, drs ....lb.	.14	.15½	.14	.15½	.14	.15½
Mono ethyl ether, drs ..lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono butyl ether, drs ..lb.	.22½	.24½	.22½	.24½	.22½	.24½
tks, wks .....lb.	...	.22	...	.22	...	.22
Diethylene oxide, 50 gal drs, wks .....lb.	.20	.24	.20	.24	.20	.24
Diglycol Laurate, bbls ...lb.	.31	.33	.16	.33	...	.16
Oleate, bbls .....lb.	...	.17	...	.17	...	.17
Stearate, bbls .....lb.	...	.22	...	.22	...	.22
Dimethylamine, 400 lb drs, pure 25 & 40% sol 100% basis .....lb.	.85	.90	.85	.90	.85	1.05
Dimethylaniline, 240 lb drs lb.	.23	.24	.23	.24	.23	.24
Dimethyl phthalate, drs, wks, frt all'd .....lb.	...	.20	...	.20	.18½	.20
Dimethylsulfate, 100 lb drs lb.	.45	.50	.45	.50	.45	.50
Dinitrobenzene, 400 lb bbls lb.	...	.18	...	.18	...	.18
Dinitrochlorobenzene, 400 lb bbls .....lb.	...	.14	...	.14	...	.14
Dinitronaphthalene, 350 lb bbls .....lb.	.35	.38	.35	.38	.35	.38
Dinitrophenol, 350 lb bbls lb.	...	.22	...	.22	...	.22
Dinitrotoluene, 300 lb bbls lb.	...	.18	...	.18	.15½	.18
Diphenyl, bbls .....lb.	...	.15	...	.15	.15	.20
Diphenylamine (A) .....lb.	...	.25	...	.25	...	.25
Diphenylguanidine, 100 lb drs .....lb.	.35	.37	.35	.37	.35	.37
Dip Oil, see Tar Acid Oil.						
Divi Divi pods, bgs shipmt ton	...	80.00	55.00	80.00	32.00	52.00
Extract .....lb.	.05¾	.06¾	.05¾	.06¾	.05¾	.06¾
Drymet (see sodium metasilicate anhydrous).						
E						
Egg Yolk, dom., 200 lb. cases lb.	.87	.92	.87	1.05	.60	1.05
Epsom Salt, tech, 300 lb bbls c-l, NY .....100 lb.	...	1.90	...	1.90	...	1.90
USP, c-l, bbls .....100 lb.	...	2.10	...	2.10	...	2.10
Ether, USP anaesthesia 55 lb drs .....lb.	.60	.61	.52	.61	.26	.53
Isopropyl 50 gal drs ...lb.	.07	.08	.07	.08	.07	.08
tks, frt all'd .....lb.	...	.06	...	.06	...	.06
Nitrous conc bottles ...lb.	.93	1.10	.73	1.10	...	.73
Synthetic, wks, tks .....lb.	...	.12½	.08	.12½	.08	.09
Ethyl Acetate, 85% Ester tks, frt all'd .....lb.	.11	.12	.11	.12	.06½	.12
drs, frt all'd .....lb.	.12	.13	.12	.13	.07½	.13
99%, tks, frt all'd ...lb.	.11¼	.12¼	.11¼	.12¼	.06¾	.12¼
drs, frt all'd .....lb.	.12¼	.13¼	.12¼	.13¼	.07¾	.13¼
Acetoacetate, 110 gal drs lb.	...	.37½	...	.37½	.27½	.37½
Benzylaniline, 300 lb drs lb.	.86	.88	.86	.88	.86	.88
Bromide, tech drs ....lb.	.50	.55	.50	.55	.50	.55
Cellulose, drs, wks, frt all'd .....lb.	.50	.60	.50	.60	.45	.50
Chloride, 200 lb drs ....lb.	.18	.20	.18	.20	.18	.20
Chlorocarbonate, cbys ..lb.	...	.30	...	.30	...	.30
Crotonate, drs .....lb.	...	.35	...	.35	...	.35
Formate, drs, frt all'd ..lb.	...	.27¼	...	.27¼	.25	.27¼
Lactate, drs, wks .....lb.	...	.33½	...	.33½	...	.33½
Oxalate, drs, wks .....lb.	...	.33	...	.33	.25	.33
Silicate, drs, wks .....lb.	...	.77	...	.77	...	.77
Ethylene Dibromide, 60 lb drs .....lb.	.65	.70	.65	.70	.65	.70
Chlorhydrin, 40%, 10 gal cbys chloro, cont ....lb.	.75	.85	.75	.85	.75	.85
Anhydrous .....lb.	...	.75	...	.75	...	.75
Dichloride, (*FP*) 50 gal drs, E. Rockies .....lb.	...	.0742	...	.0742	.0693	.0746
Glycol, 50 gal drs, wks..lb.	...	.15½	.14½	.18½	.14½	.18½
tks, wks .....lb.	...	.14½	.13½	.14½	...	.13½
Mono Butyl Ether, drs, wks .....lb.	.16½	.17½	.16½	.17½	.16½	.17½
tks, wks .....lb.	...	.15½	...	.15½	...	.15½
Mono Ethyl Ether, drs wks .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
tks, wks .....lb.	...	.13½	...	.13½	...	.13½
Mono Ethyl Ether Acetate, drs, wks .....lb.	.11½	.12½	.11½	.12½	.11½	.12½
tks, wks .....lb.	...	.10½	...	.10½	...	.10½
Mono Methyl Ether, drs wks .....lb.	.15½	.16½	.15½	.16½	.15½	.16½
tks, wks .....lb.	...	.14½	...	.14½	...	.14½
Oxide, cyl .....lb.	.50	.55	.50	.55	.50	.55
Ethylideneaniline .....lb.	.45	.47½	.45	.47½	.45	.47½
F						
Feldspar, blk pottery ....ton	17.00	19.00	17.00	19.00	17.00	19.00
Powd, blk wks .....ton	14.00	17.50	14.00	17.50	14.00	17.50
Ferric Chloride, tech, crys, 475 lb bbls .....lb.	.05	.07½	.05	.07½	.05	.07½
sol, 42° cbys .....lb.	.06½	.07	.06½	.07	.06½	.07

l + 10; *m* + 50; * Bbls. are 20c higher.
FP Full Priority. *PC* Price Ceiling. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Fish Scrap, dried, unground wks (*PC*) unit *l*	nominal	4.75	4.85	4.35	4.85
Acid, Bulk, 6 & 3%, delv Norfolk & Baltimore basis unit *m*	nominal	2.75	3.25	2.75	3.25
Fluorspar, 98% bgs (*PC*) ton	... 32.00	32.00	34.00	29.00	34.00
Formaldehyde, c-l, bbls, wks (*FP*, *PC*) lb.	.055	.0575	.055	.0575	... ...
Fossil Flour lb.	.02½	.04	.02½	.04	.02½ .04¼
Fullers Earth, blk, mines ton	8.50 15.00		8.50 15.00		8.50 15.00
Imp powd, c-l, bgs ton	30.00 40.00		30.00 40.00		no prices
Furfural (tech) drs, wks lb.	.15 .20	.15	.20	.10	.15
tks, wks lb.	... .09	...	.09	...	.09
Furfuramide (tech) 100 lb drs lb.	... .30	...	.30	...	.30
Fusel Oil, 10% impurities lb.	.18 .18½	.18	.18½	.16	.19½
Fustic, crystals, 100 lb boxes lb.	.28 .32	.28	.32	.24	.32
Liquid 50°, 600 lb bbls lb.	.12½ .16	.12½	.16	.10½	.16
Solid, 50 lb boxes lb.	.19 .21	.19	.21	.19	.21
G					
G Salt paste, 360 lb bbls lb.	... .45	...	.45	...	.45
Gambier, com 200 lb bgs lb.	no prices	...	.09½	.06½	.09½
Singapore cubes, 150 lb bgs 100 lb.	.13 nom.	.12½	.13	.08¼	.11
Glauber's Salt, tech, c-l, bgs, wks 100 lb.	1.05 1.28	1.05	1.28	.95	1.28
Anhydrous, see Sodium Sulfate					
Glue, bone, com grades, c-l bgs lb.	.15½ .18½	.15½	.18½	.13½	.18½
Better grades, c-l, bgs lb.	.19 .30	.19	.30	.15	.30
Glycerin (*PC*) CP, drs lb.	... .18¼	...	.18¼	.14½	.19½
Dynamite, 100 lb drs lb.	... .18¼	...	.18¼	...	.18¼
Saponification, drs lb.	... .12¾	...	.12¾	.09½	.20½
Soap Lye, drs lb.	... .11½	...	.11½	.07½	.18
Glyceryl Bori-Borate, bbls lb.	... .40	...	.40	...	.40
Monoricinoleate, bbls lb.	... .27	...	.27	...	.27
Monostearate, bbls lb.	... .30	...	.30	...	.30
Oleate, bbls lb.	... .22	...	.22	...	.22
Phthalate lb.	... .38	...	.38	...	.38
Glyceryl Stearate, bbls lb.	... .18	...	.18	...	.18
Glycol Bori-Borate, bbls lb.	... .22	...	.22	...	.22
Phthalate, drs lb.	... .38	...	.38	...	.38
Stearate, drs lb.	... .26	...	.26	...	.26
GUMS					
Gum Aloes, Barbadoes lb.	.80 .85	.80	.85	.80	.95
Arabic, amber sorts lb.	.18½ .19	.18½	.24	.14	.25
White sorts, No. 1, bgs lb.	.33 .35	.33	.35	.35	.45
Powd, bbls lb.	.24 .26	.24	.28	.18	.30
Asphaltum, Barbadoes (Manjak) 200 lb bgs, f.o.b. NY lb.	.04½ .12	.04½	.12	.04½	.05½
California, f.o.b. NY, drs ton	35.00 40.00	20.00	40.00	20.00	36.50
Egyptian, 200 lb cases, f.o.b. NY lb.	.12 .15	.12	.15	.12	.15
Benzoin Sumatra, USP, 120 lb cases lb.	.50 .55	.45	.55	.19	.50
Copal, Congo, 112 lb bgs, clean, opaque lb.	... .49½	...	.49½	...	.49½
Dark amber lb.	... .12¾	...	.12¾	...	.12¾
Light amber lb.	... .17	...	.17	...	.17
Copal, East India, 180 lb bgs Macassar pale bold lb.	... .17⅜	...	.17⅜	.12⅜	.17⅜
Chips lb.	... .11½	...	.11½	.06¾	.11½
Dust lb.	... .07	...	.07	.05¼	.07
Nubs lb.	... .13⅜	...	.13⅜	.10½	.13⅜
Singapore, Bold lb.	... .22⅜	...	.22⅜	.15¼	.22⅜
Chips lb.	... .12⅜	...	.12⅜	.08½	.12⅜
Dust lb.	... .07	...	.07	.05¼	.07
Nubs lb.	... .17¾	...	.17¾	.11	.17¾
Copal Manila, 180-190 lb. (A)	... .14½	.14	.14½	.13⅞	.14
Loba B lb.	... .13¾	.13¾	.14¼	.11¾	.14¼
Loba C lb.	... .13⅜	.13⅜	.13⅞	.11¼	.13⅞
DBB lb.	... .11	.11	.12¼	.10	.12½
MA sorts lb.	... .09¾	.09¾	.10¼	.07¾	.10¼
Copal Pontianak, 224 lb cases, bold gen. (A) lb.	... .22⅜	.22⅜	.22⅞	.15⅜	.22⅞
Chips lb.	... .12⅜	.12⅜	.14½	.10	.14½
Mixed lb.	... .17⅜	.17⅜	.17⅞	.14⅜	.17⅞
Nubs lb.	... .18⅜	.18⅜	.18⅞	.12¾	.18⅞
Split lb.	... .19⅛	.19⅛	.19⅝	.13¾	.19⅝
Damar Batavia, 136 lb cases (A)					
A lb.	... .35¼	...	.35¼	.21⅝	.35¼
B lb.	... .34¼	...	.34¼	.20¼	.34¼
C lb.	... .28⅝	...	.28⅝	.14⅝	.28⅝
D lb.	... .25⅛	...	.25⅛	.13¼	.25⅛
A/D lb.	... .28⅛	...	.28⅛	.15¼	.28⅛
A/E lb.	... .25⅛	...	.25⅛	.12⅞	.25⅛
E lb.	... .18¾	...	.18¾	.10	.18¾
F lb.	... .13¾	...	.13¾	.08	.13¾
Singapore, No. 1 lb.	... .30⅝	...	.30⅝	.16⅝	.30⅝
No. 2 lb.	... .25⅛	...	.25⅛	.12¼	.25⅛
No. 3 lb.	... .12⅛	...	.12⅛	.07⅛	.12⅛
Chips lb.	... .23½	...	.23½	.11	.23½
Dust lb.	... .13	...	.13	.07½	.13
Seeds lb.	... .17¾	...	.17¾	.09⅞	.17¾
Elemi, cns, c-l (A) lb.	... .08⅞	...	.08⅞	.08½	.08⅞
Ester lb.	... .09½	.08½	.09½	.06¼	.09½
Gamboge, pipe, cases lb.	2.30 2.35	.95	2.35	.95	1.00
Powd, bbls lb.	2.50 2.55	1.05	2.55	1.05	1.10
Ghatti, sol, bgs lb.	.11 .15	.11	.15	.11	.15
Karaya, bbls, bxs, drs lb.	.14 .33	.14	.33	.14	.33

FP Full Priority. *PC* Price Ceiling. (A) Allocation



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ALLIED CHEMICAL & DYE CORPORATION
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Butyl Phthalate
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HARSHAW INDUSTRIAL CHEMICALS

THE HARSHAW CHEMICAL CO
CLEVELAND, OHIO AND PRINCIPAL CITIES

Kauri, NY
Logwood

Prices

		Current Market	1942 Low	1942 High	1941 Low	1941 High
Kauri, N Y (A)						
Brown XXX, cases	lb.	...	.77	.60	.77	... .60
BX	lb.	...	.38	.	.38	... .38
B1	lb.	...	.34	.28	.34	... .28
B2	lb.	...	.30	.24	.30	... .24
B3	lb.	...	.27½	.18½	.27½	... .18½
Pale XXX	lb.	...	.66	.61	.66	... .61
No. 1	lb.	...	.43	.41	.43	... .41
No. 2	lb.	...	.31	.24	.31	... .24
No. 3	lb.	...	.22	.17¾	.22	... .17¼
Kino, tins	lb.	no prices		no prices		no prices
Mastic	lb.	3.25	3.30	3.25	3.30	1.50 3.30
Sandarac, prime quality, 200 lb bgs & 300 lb cks	lb.	.95	.97½	.95	1.10	.50 1.10
Senegal, picked bgs	lb.	...	.30	...	.30	... .30
Sorts	lb.	...	.13	...	.13	... .13
Thus, bbls	280 lbs.	...	16.50	...	16.50	15.00 16.50
Tragacanth, No. 1, cases	lb.	3.75	4.00	3.50	4.00	2.75 3.40
No. 2	lb.	2.00	3.00	2.00	3.00	2.45 2.80
No. 3	lb.	1.10	1.20	1.10	1.20	1.10 2.60
Yacca, bgs (*PC*)	lb.	.06	.07½	.06	.07¾	.03½ .07¼
H						
Hematine crys, 400 lb bbls	lb.	.24	.34	.24	.34	.20 .34
Hemlock, 25%, 600 lb bbls						
wks	lb.	...	.0385	.03½	.0385	.03⅛ .03½
tks	lb.	...	.0325	.03	.0325	.02¾ .03
Hexalene, 50 gal drs, wks	lb.	...	.23	...	.23	.23 .30
Hexane, normal 60-70° C. Group 3, tks (*PC*)	gal.	...	.11	...	.11	.09¾ .11
Hexamethylenetetramine, powd, drs (*FP*)	lb.	.32	.33	.32	.33	.32 .33
Hexyl Acetate, secondary, delv, drs	lb.	.13	.13½	.13	.13½	.13 .13½
tks	lb.	...	.12	...	.12	... .12
Hoof Meal, f.o.b. Chicago unit		4.00	4.50	3.00	4.50	2.65 3.05
Hydrogen Peroxide, 100 vol, 140 lb cbys	lb.	.16	.18½	.16	.18½	.16 .18½
Hydroxylamine Hydrochloride	lb.	...	3.15	...	3.15	... 3.15
Hypernic, Bags, No. 1	lb.	...	.42	...	.42	.40 .42
I						
Indigo, Bengal, bbls	lb.	2.14	2.20	2.14	2.20	1.63 2.20
Synthetic, liquid	lb.	.16½	.19	.16½	.19	.16½ .19
Iodine, Resublimed, jars	lb.	...	2.00	...	2.00	... 2.00
Irish Moss, ord, bales	lb.	.37	.42½	.30	.42½	.25 .31
Bleached, prime, bales	lb.	.80	.85	.80	.85	.32 .46
Iron Acetate Liq. 17°, bbls delv	lb.	.03	.04	.03	.04	.03 .04
Chloride see Ferric Chloride						
Nitrate, coml, bbls	100 lb.	3.50	4.00	3.50	4.00	3.50 4.00
Isobutyl Carbinol (128-132°C) drs, f.o.b. Wyandotte, Mich.	lb.	...	.23½	...	.23½	.22½ .23½
tks,	lb.	...	.21½	...	.21½	... .21½
Isopropyl Acetate, tks, frt all'd	lb.	...	.10	.076	.10	.06½ .07½
drs, frt all'd, c-l	lb.	...	.12	.086	.12	.07½ .08½
Ether, see Ether, isopropyl						
K						
Keiselguhr, dom bags, c-l, Pacific Coast	ton	22.00	25.00	22.00	25.00	22.00 25.00
L						
Lead Acetate, f.o.b. NY, bbls, (*PC*) White, broken	lb.	...	.12½	.12	.13¼	.11 .12½
cryst, bbls	lb.	...	.12½	.12	.13¼	.11 .12½
gran, bbls	lb.	...	.13¼	.12¾	.14	.11¾ .13¼
powd, bbls	lb.	...	.13¼	.12¾	.14	.11¾ .13¼
Arsenate, East, drs	lb.	.11	.12	.11	.12	.09 .11
Linoleate, solid, bbls	lb.	...	.22½	.19	.22½	... .19
Metal, c-l, NY (*FP*)	100 lb.	5.85	5.90	5.85	5.90	5.70 5.90
Nitrate, 500 lb bbls, wks	lb.	.11	.14	.11	.14	.11 .14
Oleate, bbls	lb.	...	.17¾	.17¼	.20	.18½ .20
Red, dry, 95% Pb_3O_4, delv	lb.	...	.09	...	.09	.08 .08¾
97% Pb_3O_4, delv	lb.	...	.09¼	...	.09¼	.084 .086
98% Pb_3O_4, delv	lb.	...	.09½	...	.09½	.0865 .0885
Resinate, fused, bbls	lb.	.10	.12	.09½	.12	.09½ .16½
Stearate, bbls	lb.	...	.25	...	.25	... .25
Titanate, bbls, c-l, f.o.b. wks, frt all'd	lb.	...	.10¼	...	.10¼	... .10¼
White, 500 lb bbls, wks, lb.		...	.07½	...	.07½	... .07½
Basic sulfate, 500 lb bbls, wks	lb.	...	.07½	.06314	.07½	.06½ .07
Lecithin, ed, dms, cl	lb.	...	.34	...	...	... ...
tech, dms, cl	lb.	...	.28	...	...	... ...
Lime, chemical quicklime, f.o.b. wks, bulk	ton	7.00	13.00	7.00	13.00	7.00 13.00
Hydrated, f.o.b. wks	ton	8.50	16.00	8.50	16.00	8.50 16.00
Lime Salts, see Calcium Salts						
Lime, sulfur, dealers, tks	gal.	no prices		.07½	.08½	... .07½
drs	gal.	no prices		.10	.14	.10 .14
Linseed Meal, bgs	ton	...	34.00	33.50	34.00	23.00 33.00
Litharge, coml, delv, bbls	lb.	...	.08	.079	.08	.07 .0760
Lithopone, dom, ordinary, (*PC*). delv, bgs	lb.	...	.04¼	...	.04¼	.0385 .04¼
bbls	lb.	...	.04½	...	.04½	.041 .04½
Titanated, bgs	lb.	...	.056	...	.056	.05¼ .056
bbls	lb.	...	.0585	...	.0585	.05½ .0585
Logwood, 51°, 600 lb bbls	lb.	...	.13	...	.13	.10½ .13
Solid, 50 lb boxes	lb.	...	.22	...	.22	.16½ .22

(*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation

Current

Madder
Morpholine

	Current Market	1942 Low	1942 High	1941 Low	1941 High
M					
Madder, Dutch ..... lb.	.24	.30	.22	.30	.22	.25
Magnesite, calc, 500 lb bbls ton	83.00	88.00	74.00	88.00	65.00	80.00
Magnesium Carb, tech, 70 lb bgs, wks ..... lb.	...	.06¼	...	.06¼	...	.06¼
Chloride flake, 375 lb bbls, c-l, wks ..... ton	...	32.00	...	32.00	...	32.00
Metal Ingots, c-l ..... lb.	...	.27	...	.27	...	...
Oxide, calc tech, heavy bbls, frt all'd ..... lb.	...	.26	...	.26	...	.26
Light bbls above basis lb.	...	.26	...	.26	...	.26
USP Heavy, bbls, above basis ..... lb.	...	.26	...	.26	...	.26
Palmitate, bbls ..... lb.	.33	.35	.33	.35	.33	.35
Silicofluoride, bbls .... lb.	.18	.20	.18	.25	.11	.25
Stearate, bbls ..... lb.	.31	.32	.31	.33	.23	.31
Manganese, acetate, drs .. lb.	...	.26½	...	.26½	...	.26½
Borate, 30%, 200 lb bbls lb.	.15	.17	.15	.17	.15	.16
Chloride, bbls ..... lb.	.14	nom.	.14	nom.	...	.14
Dioxide, tech (peroxide), paper bgs, c-l ..... ton	...	74.00	70.00	74.00	...	71.50
Hydrate, bbls ..... lb.	...	.82	...	.82	...	.82
Linoleate, liq. drs ..... lb.	...	.20	.18	.20	.18	.19½
solid, precip, bbls .... lb.	...	.22	.19	.22	...	.19
Resinate, fused bbls .... lb.	.09	.10½	.08¼	.10½	.08¼	.08½
precip, drs ..... lb.	.14½	.15½	.12	.15½	...	.12
Sulfate, tech, anhyd, 90-95%, 550 lb drs .... lb.	...	.11¼	.10½	.11½	.10½	.11½
Mangrove, 55%, 400 lb bbls lb.						
Bark, African ..... ton	no prices		no prices		34.00	38.00
Mannitol, pure cryst, cs, wks lb.	...	.85	...	.85	.85	.90
commercial grd, 250 lb bbls ..... lb.	...	.40	...	.40	.35	.45
Marble Flour, blk ..... ton	12.50	14.50	12.50	14.50	12.00	14.50
Mercury chloride (Calomel) lb.	...	2.95	...	2.95	2.70	2.95
Mercury metal ..76 lb. flasks	191.00	193.00	191.00	210.00	167.00	215.00
Mesityl Oxide, f.o.b. dest, tks ..... lb.	...	.10½	...	.10½	.10½	.15
drs, c-l ..... lb.	...	.12½	.11½	.12½	.11½	.16
drs, lcl ..... lb.	...	.13	.12	.13	.12	.16½
Meta-nitro-aniline ..... lb.	.67	.69	.67	.69	.67	.69
Meta-nitro-paratoluidine 200 lb bbls ..... lb.	1.05	1.10	1.05	1.10	1.05	1.10
Meta-phenylene diamine 300 lb bbls ..... lb.	...	.65	...	.65	...	.65
Meta-toluene-diamine 300 lb bbls ..... lb.	...	.70	...	.70	.65	.70
Methanol, denat, grd, drs, c-l frt all'd (*PC*) gal.	...	.66	...	.66	.60	.66
tks, frt all'd ..... gal.	...	.60	...	.60	...	.60
Pure, nat, drs, c-l, frt all'd ..... gal. *a*	.55½	.61½	.55½	.61½	.35½	.55½
tks, nat ..... gal. *a*	.50	.54½	.50	.54½	.30	.50
Synth, pure, drs .... gal. *b*	.34½	.40½	.34½	.40½	...	...
tks, synth ..... gal. *b*	.28	.32½	.28	.32½	...	...
Methyl Acetate, tech tks, delv ..... lb.	.06	.07	.06	.07	.06	.07
55 gal drs, delv ..... lb.	.11	.12½	.11	.12½	.07	.12½
C.P. 97-99%, tks, delv lb.	.09½	.10½	.09½	.10½	.09½	.10½
55 gal drs, delv ..... lb.	.10½	.13	.10½	.13	.10½	.13
Acetone, frt all'd, drs gal. *p*	...	.81	...	.81	.37½	.81
tks, frt all'd ..... gal. *p*	...	.75	...	.75	.32	.75
Synthetic, frt, all'd, drs ..... gal. *p*	.51	.54½	.51	.54½	.37½	.51
tks, frt all'd ...gal.	.43	.45½	.43	.45½	.32	.43
Anthraquinone ..... lb.	...	.83	...	.83	...	.83
Butyl Ketone, tks ..... lb.	...	.10½	...	.10½	...	.10½
Cellulose, 100 lb. lots, frt all'd ..... lb.	.50	.55	.50	.55	...	.55
less than 100 lbs. f.o.b. wks ..... lb.	...	.60	...	.60	...	.60
Chloride, 90 lb. cyl .... lb.	.32	.40	.32	.40	.32	.40
Ethyl Ketone, tks, frt all'd lb.	...	.08	...	.08	.06	.08
50 gal drs, frt all'd, c-l lb.	...	.09½	...	.09½	.07	.09½
Formate, drs, frt all'd .. lb.	...	.89	...	.89	...	.89
Hexyl, Ketone, pure, drs lb.	...	.60	...	.60	...	.60
Lactate, drs, frt all'd ... lb.	...	.70	...	.70	.70	.80
Mica, dry grd, bgs, wks .. ton	...	30.00	...	30.00	...	30.00
Michler's Ketone, kgs .... lb.	...	2.50	...	2.50	...	2.50
Mixed Amylnaphthalenes mixed, ref., l-c-l, drs, f.o.b. wks ..... lb.	...	.16	...	.16	.16	.19
crude ..... lb.	...	.14	...	.14	.14	.15
Monoamylamine, c-l, drs. wks lb.	...	.61	.50	.61	.50	.52
lcl, drs, wks on (100% basis) ..... lb.	...	.64	...	.64	...	.55
Monoamylnaphthalene, l-c-l, drs, f.o.b. wks ..... lb.	...	.17	...	.17	.17	.20
Monobutylamine, drs (100% basis) c-l, wks ..... lb.	...	.48	.40	.48	...	.40
l-c-l, wks ..... lb.	...	.51	.51	.64	...	.48
Monochlorobenzene, see "C"						
Monoethanolamine, tks, wks, lb.	...	.23	...	.23	...	.23
Monoethylamine (100% basis) lcl, drs, f.o.b. wks ..... lb.	...	.46	...	.46	.35	.65
Monomethylamine, drs, frt all'd, E. Mississippi, c-l lb.	...	.65	...	.65	...	.65
Monomethylparamiosulfate, 100 lb drs ..... lb.	3.75	4.00	3.75	4.00	3.75	4.00
Morpholine, drs 55 gal, wks ..... lb.	...	.67	...	.67	...	.67

a Producers of natural methanol divided into two groups and prices vary for these two divisions; *b* Country is divided in 4 zones, prices varying by zone; *p* Country is divided into 4 zones.

(*FP*) Full Priority. (*PC*) Price Control.

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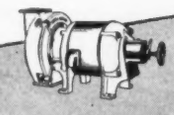
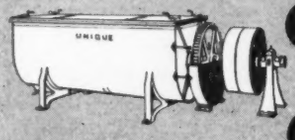
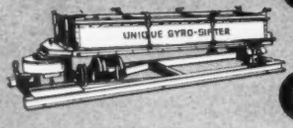


GRINDING



MIXING



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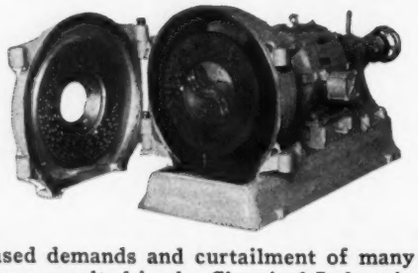

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(Incorporated in 1895)

119 Sherman Street Muncy, Pennsylvania

Engineers—Designers—Manufacturers

Since 1866

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Myrobalans 25%, liq bbls lb.	no prices		no prices		no prices
50% Solid, 50 lb boxes lb.	no prices		no prices		no prices
J1 bgs ton	no prices		no prices	35.00	48.00
J2 bgs ton	no prices		no prices	28.00	39.00
N					
Naphtha, v.m.&p. (deodorized) see petroleum solvents.					
Naphtha, Solvent, water-white, tks gal.	...	.27	...	.27	...	.26
drs, c-l gal.	...	.31	...	.31	...	.31
Naphthalene, dom, crude bgs. wks lb.	2.75	3.00	2.50	3.00	2.25	2.75
Balls, flakes, pks lb.	...	.08	...	.08	.06¼	.08
Balls, ref'd bbls, wks lb.	...	.08	...	.08	.07	.08
Flakes, re'd, bbls, wks lb.	...	.08	...	.08	.07	.08
Nickel Carbonate, bbls (A) lb.	.36	.36½	.36	.36½	.36	.36½
Chloride, bbls lb.	.18	.20	.18	.20	.18	.20
Metal ingot lb.	.35	.36	.35	.36	.34	.36
Oxide, 100 lb kgs, NY lb.	.35	.38	.35	.38	.35	.38
Salt, 400 lb bbls, NY lb.	.13	.13½	.13	.13½	.13	.13½
Nicotine, sulfate, 40%, drs, 55 lb drs lb.	...	.703	...	.703	...	.703
Nitre Cake, blk ton	...	16.00	...	16.00	...	16.00
Nitrobenzene redistilled, 1000 lb drs, wks lb.	.08	.09	.08	.09	.08	.09
tks lb.	...	.07	...	.07	...	.07
Nitrocellulose, c-l, lcl, wks lb.	.20	.29	.20	.29	.20	.29
Nitrogen Sol. 45½% ammon, f.o.b. Atlantic & Gulf ports, tks, unit ton, N basis	...	1.2158	...	1.2158	...	1.2158
Nitrogenous Mat'l, bgs imp unit	no prices		no prices		no prices	
dom, Eastern wks unit	...	3.00	2.75	3.50	2.20	3.00
dom, Western wks unit	...	2.50	2.60	3.35	1.75	2.60
Nitronaphthalene, 550 lb bbls lb.	.24	.25	.24	.25	.24	.25
Nutgalls Alleppo, bgs lb.	no prices		no prices		.26	.29
O						
Oak Bark Extract, 25%, bbls lb.	.0385	...	.03½	.03¾	.03⅛	.03¾
tks lb.	...	.0325	.02	.0325	.02¾	.03
Octyl Acetate, tks, wks lb.	...	.15	...	.15	...	.15
Orange-Mineral, 1100 lb cks NY lb.	...	.12	...	.12	.11	.11⅛
Orthoaminophenol, 50 lb kgs lb.	2.15	2.25	2.15	2.25	2.15	2.25
Ortho amyl phenol, l-c-l, drs, f.o.b. wks lb.	...	.25	...	.25	.15	.25
Orthoanisidine, 100 lb drs lb.	...	.70	...	.70	...	.70
Orthochlorophenol, drs lb.	...	.32	...	.32	...	.32
Orthocresol, 30.4°, drs, wks (A) lb.	.17	.17½	.17	.17½	.16	.17½
Orthodichlorobenzene, 1000 lb drs lb.	.06	.07½	.06	.07½	.06	.07½
Orthonitrochlorobenzene, 1200 lb drs, wks lb.	.15	.16	.15	.18	.15	.18
Orthonitroparachlorphenol, tins lb.	...	.75	...	.75	...	.75
Orthonitrophenol, 350 lb drs lb.	.85	.90	.85	.90	.85	.90
Orthonitrotoluene, 1000 lb drs, wks lb.	...	.09	...	.09	...	.09
Orthotoluidine, 350 lb bbls, lcl lb.	...	.19	...	.19	...	.19
Osage Orange, cryst, bbls lb.	...	.23	...	.23	.21	.23
51° liquid lb.	...	.10	...	.10	...	.10
P						
Paraffin, rfd, 200 lb bgs (*PC*) 122-127° M P lb.	...	.052	...	.052	.04¼	.057
128-132° M P lb.	.056	.0585	.056	.0585	.057	.0595
133-137° M P lb.	.0615	.0640	.0615	.0640	.06¼	.06½
Para aldehyde, 99%, tech, 55-110 gal drs, wks lb.	...	.12	...	.12	.10	.12
Aminoacetanilid, 100 lb kgs lb.	...	.85	...	.85	...	.85
Aminohydrochloride, 100 lb kgs lb.	1.25	1.30	1.25	1.30	1.25	1.30
Aminophenol, 100 lb kgs lb.	...	1.05	...	1.05	...	1.05
Chlorophenol, drs lb.	...	.32	...	.32	...	.32
Dichlorobenzine 200 lb drs, wks lb.	.11	.12	.11	.12	.11	.12
Formaldehyde, drs, wks (*FP*) lb.	.23	.24	.23	.24	.23	.24
Nitroacetanilid, 300 lb bbls lb.	.45	.52	.45	.52	.45	.52
Nitroaniline, 300 lb bbls, wks lb.	...	.45	...	.45	...	.45
Nitrochlorobenzene, 1200 lb drs, wks lb.	...	.15	...	.15	...	.15
Nitro-orthotoluidine, 300 lb bbls lb.	2.75	2.85	2.75	2.85	2.75	2.85
Nitrophenol, 185 lb bbls lb.	...	.35	...	.35	...	.35
Nitrosodimethylaniline, 120 lb bbls lb.	.92	.94	.92	.94	.92	.94
Nitrotoluene, 350 lb bbls lb.	...	.30	...	.30	...	.30
Pentaerythritol, tech, bbls, delv lb.	.33½	.35½	.33½	.35½	...	...
Phenylenediamine, 350 lb bbls lb.	1.25	1.30	1.25	1.30	1.25	1.30
Toluenesulfonamide, 175 lb. bbls lb.	...	.70	...	.70	...	.70
tks, wks lb.	...	.31	...	.31	...	.31
Toluenesulfonchloride, 410 lb bbls, wks lb.	.20	.22	.20	.22	.20	.22
Toluidine, 350 lb bbls, wks lb.	...	.48	...	.48	...	.48

(*FP*) Full Priority. (*PC*) Price Control (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Paris Green, dealers, drs lb.	.24	.24	.26	.23	.25
Pentane, normal, 28-38° C, group, 3 tks (*PC*) ..gal.	...	.06½	.06½	.08½	.08½
drs, group 3 .....gal.	...	.11	.11½	.16	.11½ .16
Perchlorethylene, 10 lb drs, frt all'd (*FP*) .....lb.	.08	.08½	.08	.08½	.08 .08½
Petrolatum, dark amber, bbls .....lb.	...	.03¼	...	.03¼	.02¾ .03½
White, lily, bbls .....lb.	...	.05¼	...	.05¼	.04¾ .05¼
White, snow, bbls .....lb.	...	.06½	...	.06½	.05½ .06½
Petroleum Ether, 30-60°, group 3, tks .....gal.	...	.16	...	.16	.13½ .16
drs, group 3 .....gal.	...	.18	...	.18	.14½ .18

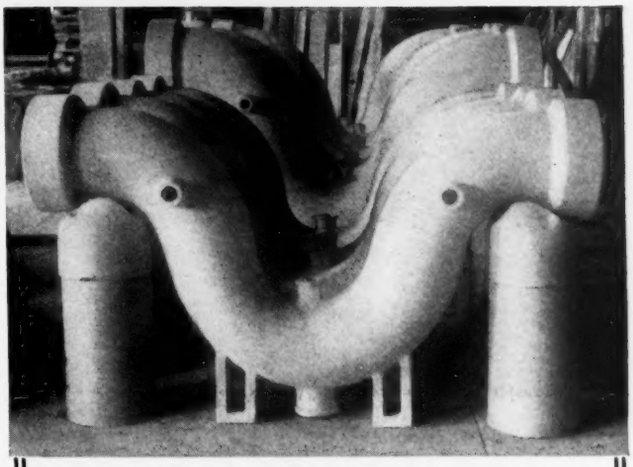
PETROLEUM SOLVENTS AND DILUENTS

Cleaners naphthas, group 3, tks, wks .....gal.	...	.07⅛	...	.07⅛	.07	.07⅛
East Coast, tks, wks gal.	...	.11	.10½	.11	.10	.10½
Lacquer diluents, tks East Coast .....gal.	...	.11	...	.11	.09½	.11
Group 3, tks .....gal.	.07⅜	.07½	.07⅜	.08⅛	.06¼	.08⅛
Naphtha, V.M.P., East tks, wks .....gal.	...	.11	.10½	.11	.09	.11
Group 3, tks, wks ...gal.	...	.07⅛	...	.07⅛	.06	.07⅛
Petroleum thinner, 43-47, East, tks, wks .....gal.	.08¾	.09½	.08¾	.09½	.08¾	.09½
Group 3, tks, wks ...gal.	.06	.07	.06	.07	.05⅞	.07
Rubber Solvents, stand grd, East, tks, wks ..gal.	...	.11	.10½	.11	.09½	.10½
Group 3, tks, wks ...gal.	...	.07⅜	...	.07⅜	.06	.07⅜
Stoddard Solvents, East, tks, wks .....gal.	...	.09½	...	.09½	.083	.09½
Group 3, wks .....gal.	...	.06⅜	...	.06⅜	.05½	.06⅜
Phenol, 250-100 lb drs ....lb.	...	.12½	.12½	.13	.12	.13¾
tks, wks (*FP*) (A) ....lb.	...	.11½	.11½	.12	.11	.12
Phenyl-Alpha-Naphthylamine, 100 lb kgs .....lb.	...	1.35	...	1.35	...	1.35
Phenyl Chloride, drs .....lb.	...	.17	...	.17	...	.17
Phenylhydrazine Hydrochloride, com .....lb.	...	1.75	...	1.75	...	1.50
Phloroglucinol, tech, tins ..lb.	15.00	16.50	15.00	16.50	15.00	16.50
CP, tons .....lb.	20.00	22.00	20.00	22.00	20.00	22.00
Phosphate Rock, f.o.b. mines 70% basis .....ton	...	2.70	2.40	2.70	2.15	2.40
72% basis .....ton	...	3.20	3.00	3.20	2.50	3.00
Florida Pebble, 68% basis ton	...	2.20	2.00	2.20	1.90	2.00
75-74% basis .....ton	...	4.00	...	4.00	...	2.90
Tennessee, 72% basis ..ton	...	5.50	5.00	5.50	4.50	5.00
Phosphorus Oxychloride 175 lb. cyl (*FP*) .....lb.	.15	.18	.15	.18	.15	.18
Red, 110 lb cases .....lb.	.40	.44	.40	.44	.40	.44
Sesquisulfide, 100 lb cs .lb.	.38	.42	.38	.42	.38	.42
Trichloride, cyl .....lb.	.15	.16	.15	.16	.15	.16
Yellow, 110 lb cs, wks lb.	.18	.20	.18	.20	.18	.20
Phthalic Anhydride, 100 lb drs, wks (A) .....lb.	.14½	.15½	.14½	.15½	.14½	.15½
Pine Oil, 55 gal drs or bbls Destructive dist .....lb.	.72	.74	.72	.74	.50	.65
Steam dist wat wh bbls gal.	1.00	nom	1.00	1.10	.59	.68
Pitch Hardwood, wks ...ton	23.75	24.00	23.75	24.00	23.75	24.00
Coaltar, bbls, wks ....ton	19.00	22.00	19.00	22.00	19.00	22.00
Burgundy, dom, bbls, wks lb.	.06	.06½	.06	.06½	.06	.06½
Imported .....lb.	no prices		no prices		no prices	
Petroleum, see Asphaltum in Gums' Section.						
Pine, bbls .....bbl.	6.75	7.00	6.75	7.00	6.00	7.00
Polyamylnaphthalene, 1-c-l, drs, f.o.b. wks .....lb.	...	.25	...	.25	.25	.30
Potash, Caustic, wks, sol ..lb	.06¼	.06¾	.06¼	.06¾	.06¼	.06¾
flake .....lb.	...	.07	...	.07	...	.07
liquid, tks .....lb.	...	.02⅞	...	.02⅞	...	.02⅞
Manure Salts, Dom 30% basis, blk .....unit	...	.60	...	.60	...	.60

POTASSIUM

Potassium Abietate, bbls ..lb.	...	.08	...	.08	...	.08
Acetate, tech, bbls, delv lb.	...	.28	...	.28	.26	.28
Bicarbonate, USP, 320 lb bbls .....lb.	.19	.21	.14	.21	.14	.17
Bichromate Crystals, 725 lb csks *(*FP*) .....lb.	...	.09⅝	...	.09⅝	.08⅞	.09⅝
Binoxalate, 30 lb bbls ..lb.	...	.23	...	.23	...	.23
Bisulfate, 100 lb kgs ...lb.	.15½	.18	.15½	.18	.15½	.18
Carbonate, 80-85% calc 800 lb cks .....lb.	.06½	.06¾	.06½	.06¾	.06½	.06¾
liquid, tks .....lb.	...	.0275	...	.0275	...	.0275
drs, wks .....lb.	.03	.03⅛	.03	.03⅛	.03	.03⅛
Chlorate crys, 112 lb kgs, wks (*FP*) (A) .....lb.	nom.	.11	nom.	.11	...	.11
gran, kgs .....lb.	.12	.14½	.12	.14½	.12	.14½
powd, kgs .....lb.	.09¾	.10	.09¾	.10	.09½	.10
Chloride, crys, bbls ....lb.	.08	nom.	.08	nom.	.04	.08
Chromate, kgs (*FP*) ...lb.	.24	.27	.24	.27	.24	.27
Cyanide, drs .....lb.	...	.55	...	.55	...	.55
Iodide, 250 lb bbls .....lb.	1.44	1.48	1.44	1.48	1.35	1.38
Metabisulfite, 300 lb bbls lb.	.18	.20	.18	.20	.18	.21
Muriate, bgs, dom, blk unit	.56	.58	.56	.58	.53½	.58
Oxalate, bbls .....lb.	.28	.30	.28	.30	.25	.30
Perchlorate, kgs, wks (FP) (A) .....lb.	.09½	.11	.09½	.11	.09½	.11

* Spot price is ⅛c higher.
(*FP*) Full Priority. (*PC*) Price Control. (A) Allocation



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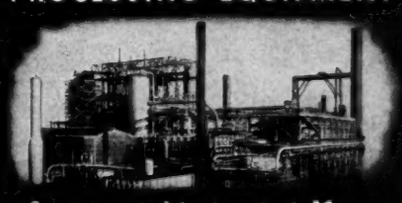

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	Current Market	1942 Low	1942 High	1941 Low	1941 High
Potassium (continued):					
Permanganate, USP, crys, 500 & 1000 lb drs, wks (*FP*) ....lb.	.20½ .21	.19¼	.21	.19¼	.21
Prussiate, red, bbls ....lb.	no prices	no prices		no prices	
Yellow, bbls ....lb.	.17 .19	.17	.19	.16	.19
Sulfate, 90% basis, bgs ton	... 36.25	...	36.25	...	36.25
Titanium Oxalate, 200 lb bbls ....lb.	... .45	...	.45	...	.45
Pot & Mag Sulfate, 48% basis bgs ....ton	... 26.00	...	26.00	26.00	27.00
Propane, group 3, tks (*PC*) lb.	.02¾ .03¾	.02¾	.03¾	.03¾	.04
Putty, com'l, tubs ....100 lb.	... 3.15	...	3.15	...	3.15
Linseed Oil, kgs ...100 lb.	... 5.00	...	5.00	...	5.00
Pyrethrum, conc liq: (A)					
2.4% pyrethrins, drs, frt all'd ....gal.	... 5.75	4.30	5.75	4.40	4.95
3.6% pyrethrins, drs, frt all'd ....gal.	... 8.53	6.35	8.53	6.60	7.20
Flowers, coarse, bgs ...lb.					
bgs ....lb.	.27 .28	.21	.28	.20	.25
Fine powd, bbls ....lb.	... .23	.22	.29	.21	.26
Pyridine, denat, 50 gal drs gal.	... 1.71	...	1.71	...	1.71
Refined, drs ....lb.	... .46	...	.46	...	.48
Pyrites, Spanish cif Atlantic ports, blk ....unit	no prices	no prices		no prices	
Pyrocatechin, CP, drs, tins lb.	2.15 2.40	2.15	2.40	2.15	2.40
Q					
Quebracho, 35% liq tks ..lb.	... .05¼	...	.05¼	.03¾	.05½
450 lb bbls, c-l ....lb.	... .05	...	.05	.04¼	.05
Solid, 63%, 100 lb bales cif ....lb.	... .04⅞	...	.04⅞	...	.04⅞
Clarified, 64% bales ..lb.	... .05	...	.05	.05	.05½
Quercitron, 41 deg liq, 450 lb. bbls ....lb.	... .10	...	.10	.08½	.09½
Solid, drs ....lb.	... .18½	.18	.18½	.11	.16½
R					
R Salt, 250 lb bbls, wks ..lb.	... .55	...	.55	...	.55
Resorcinol, tech cans ....lb.	.68 .74	.68	.74	.68	.74
Rochelle Salt, cryst ....lb.	... .43½	...	.43½	.32½	.43½
Powd, bbls ....lb.	... .42½	..	.42½	.31½	.42½
Rosin Oil, bbls, first run gal.	... .51	.48	.51	.40	.50
Second run ....gal.	... .53	.50	.53	.42	.56
Third run, drs ....gal.	... .57	.54	.57	.46	.57
Rosins 600 lb bbls, 100 lb unit ex, yard NY:**					
B	... 3.55	2.96	3.66	2.06	3.55
D	... 3.58	2.73	3.65	2.08	3.55
E	... 3.61	3.06	3.74	2.07	3.62
F	... 3.68	3.27	3.79	2.08	3.59
G	... 3.76	3.52	3.79	2.18	3.52
H	... 3.77	3.53	3.79	2.27	3.50
I	... 3.82	3.53	3.79	2.26	3.50
K	... 3.87	3.56	3.88	2.36	3.61
M	... 3.90	3.70	3.94	2.38	3.68
N	... 3.95	3.70	4.05	2.47	3.71
WG	... 4.00	3.71	4.81	2.79	4.52
WW	... 4.07	3.75	5.20	3.05	4.57
X	... 4.07	3.75	5.20	3.10	4.57
Rosins, Gum, Savannah (280 lb. unit):**					
B	... 3.01	2.08	3.10	1.31	3.00
D	... 3.01	2.31	3.21	1.51	3.00
E	... 3.06	2.41	3.27	1.60	3.07
F	... 3.10	2.62	3.24	1.62	3.04
G	... 3.15	2.87	3.24	1.60	2.97
H	... 3.20	2.88	3.24	1.63	2.97
I	... 3.26	2.88	3.26	...	2.98
K	... 3.35	2.91	3.35	1.84	3.06
M	... 3.40	3.05	3.40	2.01	3.13
N	... 3.45	3.05	3.50	2.65	3.16
WG	... 3.50	3.06	4.26	2.76	3.97
WW	... 3.50	3.10	4.65	2.96	4.02
X	... 3.50	3.10	4.65	2.96	4.02
Rosin, Wood, c-l, FF grade, NY	1.70 2.00	1.70	2.00	1.40	2.00
Rotten Stone, bgs mines ton	25.50 37.50	25.50	37.50	25.50	37.50
Imported, lump, bbls ..lb.	no prices	no prices		no prices	
Powdered, bbls ....lb.	no prices	no prices		no prices	
S					
Sago Flour, 150 lb bgs ..lb.	.05 .05¼	.04¼	.05¼	.03½	.05½
Sal Soda, bbls wks ...100 lb.	... 1.20	...	1.20	...	1.20
Salt Cake, 94-96%, c-l, bulk wks ....ton	... 15.00	...	15.00	13.00	17.00
Chrome, c-l, wks ....ton	... 16.00	...	16.00	...	16.00
Saltpetre, gran, 450-500 lb bbls ....lb.	... .082	...	.082	.076	.082
Cryst, bbls ....lb.	... .092	...	.092	.086	.092
Powd, bbls ....lb.	... .092	...	.092	.086	.092
Satin, White, pulp, 550 lb bbls ....lb.	.01¼ .01½	.01¼	.01½	.01¼	.01½
Schaeffer's Salt, kgs ....lb.	... .46	...	.46	...	.46

** Jan. 30, 1941, high and low based on 280 lb. unit. June 30 prices. r Bone dry prices at Chicago 1c higher; Boston ½c; Pacific Coast 2c; Philadelphia deliveries f.o.b. N. Y., refined 6c higher in each case; (*FP*) Full Priority. (*PC*) Price Ceiling. (A) Allocation

Current

Shellac
Sodium Sulforicinoleate

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Shellac, Bone dry, bbls ..lb. *s*	.39	.40	.39	.40	.26	.40
Garnet, bgs .....lb.	.37	.39	.37	.39	.20	.39
Superfine, bgs .....lb. *s*	.32	.33	.32	.34	.16½	.34
T. N., bgs .....lb. *s*	.31	.32	.31	.33	.16	.33
Silver Nitrate, vials .....oz.	...	.26⅞	...	.26⅞	.24	.26⅞
Slate Flour, bgs, wks ....ton	11.00	12.00	9.00	12.00	9.00	10.00
Soda Ash, 58% dense, bgs, c-l, wks .....100 lb.	...	1.15	...	1.15	...	1.15
58% light, bgs ....100 lb.	1.05	1.13	1.05	1.13	1.05	1.08
blk .....100 lb.	...	.90	...	.90	...	.90
paper bgs .....100 lb.	1.05	1.08	1.05	1.08	1.05	1.08
bbls .....100 lb.	...	1.35	...	1.35	1.35	1.45
Caustic, 76% grnd & flake, drs .....100 lb.	...	2.70	...	2.70	...	2.70
76% solid, drs .....100 lb.	...	2.30	...	2.30	...	2.30
Liquid sellers, tks ..100 lb.	...	2.00	...	2.00	...	2.00
SODIUM						
Sodium Abietate, drs .....lb.	...	.11	...	.11	...	.11
Acetate, 60% tech, gran. powd, flake, 450 lb bbls wks .....lb.	...	.05	...	.05	.04	.06
90%, bbls 275 lb delv lb.	.06½	.07	.06½	.07	.06	.07
anhyd, drs, delv .....lb.	.08½	.10	.08½	.10	.08¼	.10
Alginate, drs .....lb.	...	.79	.69	.79	.39	.73
Antimoniate, bbls .....lb.	.15	.15½	.15	.15½	.14	.15½
Arsenate, drs .....lb.	...	.08	...	.08	.07	.08¼
Arsenite, liq, drs .....gal.	...	.35	...	.35	...	.35
Dry, gray, drs, wks ..lb.	...	.06¼	...	.06¼	.06½	.09¼
Benzoate, USP kgs ....lb.	.46	.50	.46	.50	.46	.50
Bicarb, powd, 400 lb bbl, wks .....100 lb.	...	1.85	1.70	1.85	...	1.70
Bichromate, 500 lb cks, wks* (*FP*) .....lb.	...	.07⅜	...	.07⅜	.06⅞	.07½
Bisulfite, 500 lb bbls, wks lb.	.03	.031	.03	.031	.03	.031
35-40% sol bbls, wks 100 lb.	1.35	1.80	1.35	1.80	1.40	1.80
Chlorate, bgs, wks (A) lb.	...	.06¼	...	.06¼	...	.06¼
Cyanide, 96-98%, 100 & 250 lb drs, wks .....lb.	.14	.15	.14	.15	.14	.15
Diacetate, 33-35% acid, bbls, lcl, delv .....lb.	.09½	.10½	.09½	.10½	.09	.10
Fluoride, white 90%, 300 lb bbls, wks .....lb.	...	.08	...	.08	.07	.08
Hydrosulfite, 200 lb bbls, f.o.b. wks .....lb.	.17	.18	.17	.18	.17	.18
Hyposulfite, tech, pea crys 375 lb bbls, wks ..100 lb.	2.75	3.00	2.75	3.00	...	2.80
Tech, reg cryst, 375 lb bbls, wks .....100 lb.	...	2.45	...	2.45	...	2.45
Iodide, Jars .....lb.	...	2.42	...	2.42	...	2.42
Metanilate, 150 lb bbls ..lb.	...	.40	...	.40	.41	nom.
Metasilicate, gran, c-l, wks .....100 lb.	...	2.50	...	2.50	2.35	2.50
cryst, drs, c-l, wks 100 lb.	...	3.05	...	3.05	...	3.05
Anhydrous, wks, c-l, drs .....100 lb.	...	4.00	...	4.00	3.75	4.00
wks, lcl, drs ...100 lb.	...	5.05	...	5.05	5.05	5.05
Monohydrated, bbls ....lb.	...	.03	.026	.03	.023	.026
Naphthenate, drs .....lb.	.12	.19	.12	.19	.12	.19
Naphthionate, 300 lb bbl lb.	...	.50	...	.50	...	.50
Nitrate, 92% crude, 200 lb. bgs. c-l, NY (A) ...ton	...	29.35	...	29.35	28.70	29.35
100 bgs, same basis ..ton	...	30.05	...	30.05	29.40	30.05
Bulk .....ton	...	27.00	...	27.00	...	27.00
Nitrite, 500 lb bbls ....lb.	...	.06¼	...	.06¼	.06¼	.11½
Orthochlorotoluene, sulfonate, 175 lb bbls, wks lb.	.25	.27	.25	.27	.25	.27
Orthosilicate, 300 lb drs, c-l anhyd. .....lb.	...	.04½	.04½	.04¾	.04½	.04¾
hyd, flake, 300 lb bbls, cl, f.o.b. wks .....lb.	...	.0315	.03	.0315	.0285	.03
Perborate, drs, 400 lb ..lb.	...	.14¾	...	.14¾	.14¾	.15¼
Peroxide, bbls, 400 lb ..lb.	...	.17	...	.17	...	.17
Phosphate, di-sodium, tech, 310 lb bbls, wks 100 lb.	2.75	2.90	2.75	2.90	2.30	2.90
bgs, wks .....100 lb.	2.55	2.70	2.55	2.70	2.10	2.70
Tri-sodium, tech, 325 lb. bbls, wks .....100 lb.	...	2.90	2.90	3.05	2.45	3.05
bgs, wks .....100 lb.	...	2.70	2.70	2.85	2.25	2.85
Picramate, 160 lb kgs ..lb.	...	.65	...	.65	...	.65
Prussiate, Yellow, 350 lb bbls, wks .....lb.	...	.11	...	.11	.10½	.11
Pyrophosphate, anhyd, 100 lb bbls f.o.b. wks frt eq lb.	.0545	.063	.0545	.0638	.0510	.0610
Sesquisilicate, drs, c-l, wks .....100 lb.	...	3.05	...	3.05	...	3.05
Silicate, 60°, 55 gal drs, wks .....100 lb.	...	1.70	...	1.70	...	1.70
40°, 55 gal drs, wks 100 lb.	...	.80	...	.80	...	.80
tks, wks .....100 lb.	...	.65	...	.65	...	.65
Silicofluoride, 450 lb bbls NY .....lb.	.09	.14½	.09	.15	.09¾	.15
Stannate, 100 lb drs ....lb.	.33½	.36½	.33½	.36½	.32½	.37
Stearate, bbls .....lb.	.19	.24	.19	.24	.19	.24
Sulfanilate, 400 lb bbls lb.	.16	.18	.16	.18	.16	.18
Sulfate, Anhyd, 550 lb bgs c-l, wks .....100 lb. *t*	1.70	1.90	1.70	1.90	1.45	1.90
Sulfide, 80% cryst, 440 lb. bbls, c-l, wks .....lb.	...	.024	...	.024	.02¼	.03
Solid, 650 lb drs, c-l, wks .....lb.	...	.0315	...	.0315	.03	.03¼
Sulfite, powd, 400 lb bbls wks .....lb.	...	.05¼	...	.05¼	...	.05¼
Sulfocyanide, drs .....lb.	.55	.65	.55	.65	.28	.65
Sulforicinoleate, bbls ...lb.	...	.12	...	.12	...	.12

s T. N. and Superfine prices quoted f.o.b. N. Y. and Boston; Chicago prices 1c higher; Pacific Coast 3c; Philadelphia f.o.b. N. Y. *t* Bags 15c lower; * Feb. 28. (*PC*) Price Control. (A) Allocation

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29th & GRAY'S FERRY ROAD PHILADELPHIA, PA.

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Supersilicate (see sodium sesquisilicate)					
Tungstate, tech, crys, kgs lb.	no prices	no prices		no prices	
Sorbitol, drs, wks lb.	...	.17¼	...	.17¾	.14¾ .15¼
Spruce, Extract, ord, tks lb.	...	.01½	.01¼	.01½	.01⅛ .01¼
Ordinary, bbls lb.	...	.02⅛	.01¾	.02⅛	.01⅝ .01¾
Super spruce ext, tks lb.	...	.01½	...	.01½	.01⅜ .01½
Super spruce ext, bbls lb.	...	.02	...	.02	.01⅞ .02
Super spruce ext, powd, bgs lb.	...	.04½	.04	.04½	... .04
Starch, Pearl, 140 lb bgs 100 lb.	...	3.10	...	3.10	2.90 3.10
Powd, 140 lb bgs 100 lb.	...	3.20	...	3.20	3.05 3.80
Potato, 200 lb bgs lb.	...	.0637	.061	.0637	.04½ .0635
Imp, bgs lb.	no prices	no prices		no prices	
Rice, 200 lb bbls lb.	.09	.10	.09	.10	.07½ .09½
Sweet Potato, 240 lb bbls, f.o.b. plant 100 lb.	nom.	7.00	nom.	7.00	nom. 7.00
Wheat, thick, bgs lb.	...	.05	...	.05	... .05
Strontium, carbonate, 600 lb bbls, wks lb.	no prices	no prices		no prices	
Nitrate, 600 lb bbls, NY lb.	.07¾	.08¾	.07¾	.08¾	.07¾ .08¾
Sucrose, octa-acetate, den, grd, bbls, wks lb.	...	.45	...	.45	... .45
tech, bbls, wks lb.	...	.40	...	.40	... .40
SULFUR					
Sulfur, crude, f.o.b. mines ton	...	16.00	...	16.00	... 16.00
Flour, com'l, bgs 100 lb.	1.65	1.95	1.65	1.95	1.40 1.95
bbls 100 lb.	1.95	2.50	1.95	2.50	1.95 2.50
Rubbermakers, bgs 100 lb.	...	2.05	...	2.05	... 2.05
bbls 100 lb.	...	2.35	...	2.35	... 2.35
Extra fine, bgs 100 lb.	...	2.35	...	2.35	... 2.35
Superfine, bgs 100 lb.	2.65	2.80	2.65	2.80	2.65 2.80
bbls 100 lb.	2.25	3.10	2.25	3.10	2.25 3.10
Flowers, bgs 100 lb.	3.05	3.35	3.05	3.35	2.80 3.35
bbls 100 lb.	3.40	3.70	3.40	3.70	3.15 3.70
Roll, bgs 100 lb.	2.40	2.70	2.40	2.70	2.15 2.70
bbls 100 lb.	2.30	2.85	2.30	2.85	2.30 2.85
Sulfur Chloride, 700 lb drs, wks lb.	.03	.08	.03	.08	.03 .08
Sulfur Dioxide, 150 lb cyl lb.	.07	.08	.07	.09	.07 .09
Multiple units, wks lb.	.04½	.06	.04½	.07	.04½ .07
tks, wks lb.	.04	.06	.04	.06	.04 .06
Refrigeration, cyl, wks lb.	.13	.21	.13	.40	.16 .40
Multiple units, wks lb.	...	.06½	.06½	.10	.07½ .10
Sulfuryl Chloride lb.	.15	.40	.15	.40	.15 .40
Sumac, Italian, grd ton	no prices	no prices		no prices	
Extract, 42°, bbls lb.	...	.08	.06¼	.08	.06 .08
Superphosphate, 16% bulk, wks ton	10.10	10.74	10.10	10.80	8.50 10.00
Run of pile ton	9.60	10.24	9.60	10.24	8.00 9.60
Triple, 40-48%, a.p.a. bulk, wks, Balt. unit ton	.80	.85	.80	.85	.68 .80
T					
Talc, Crude, 100 lb bgs, NY ton	12.50	24.50	12.50	24.50	14.00 16.00
Ref'd 100 lb bgs, NY ton	17.25	19.25	17.25	19.25	17.25 19.25
French, 220 lb bgs, NY ton	no prices	no prices		no prices	
Ref'd, white bgs, NY ton	no prices	no prices		no prices	
Italian, 220 lb bgs to arr ton	no prices	no prices		no prices	
Ref'd, white bgs, NY ton	no prices	no prices		no prices	
Tankage, Grd, NY unit u	...	4.60	4.25	4.85	2.35 4.10
Ungrd unit u	...	4.96	5.25	5.70	2.35 5.10
Fert grade, f.o.b. Chgo unit u	...	5.37	5.60	5.90	2.35 5.60
South American cif unit u	...	5.35	5.05	5.60	2.60 4.75
Tapioca Flour, high grade, bgs lb.	.04¾	.07¼	.04	.07¼	.03 .06¾
Tar Acid Oil, 15%, drs gal.	...	.27½	...	.27½	.22 .24
25% drs (A) gal.	...	.31½	...	.31½	.25 .27½
Tar, pine, delv, drs gal.	...	.33	.32½	.33	.26 .29
tks, delv, E. cities gal.	...	.24½	.24	.24½	... .22
Tartar Emetic, tech, bbls lb.	...	.47¾	...	.47¾	.36¾ .47¾
USP, bbls lb.	.52¾	.53	.52¾	.53	.42 .53
Terpineol, den grade, drs lb.	...	.17	...	.17	... .17
Tetrachlorethane, 650 lb drs lb.	.08	.08½	.08	.08½	.08 .08½
Tetrachlorethylene, drs, tech lb.	.08	.09	.08	.09	.08 .09
Tetralene, 50 gal drs, wks lb.	...	.19	...	.19	.19 .21
Thiocarbanilid, 170 lb bbls lb.	...	.24	...	.24	... .24
Tin, crystals 500 lb bbls, wks lb	.39	.39½	.39	.39½	.38 .40
Metal, NY (*PC*) (A) lb.	...	.52	...	.52	.501 .52¾
Oxide, bbls, wks lb.	...	.55	.55	.57	.54 .56
Tetrachloride, 100 lb drs, wks lb.	no prices	no prices		.25¼	.31
Titanium Dioxide, 300 lb bbls (*PC*) lb.	...	.14½	...	.14½	.13¾ .14½
Barium Pigment, bbls lb.	.05¾	.06½	.05¾	.06½	.05¾ .06½
Calcium Pigment, bbls lb.	.05½	.05¾	.05½	.05¾	.05½ .05¾
Titanium tetrachloride, drs, f.o.b. Niagara Falls lb.	.32	.45	.32	.45	.32 .45
Titanium trichloride 23% sol, bbls f.o.b. Niagara Falls lb.	.22	.26	.22	.26	.22 .26
20% solution, bbls lb.	.175	.215	.175	.215	.175 .215
Toluidine, mixed, 900 lb drs, wks lb.	...	.26	...	.26	... .26
Toluol, drs, wks (*FP*) (A) gal.	...	.33	...	.33	.32 .33
tks, frt all'd (*FP*) gal.	...	.28	...	.28	.27 .28
Toner Lithol, red, bbls lb.	.55	.60	.55	.60	.55 .60
Para, red, bbls lb.	.70	.75	.70	.75	.70 .75
Toluidine, bgs lb.	...	1.05	...	1.05	... 1.05
Triacetin, 50 gal drs, wks, lb.	...	.26	...	.26	... .26
Triamyl Borate, lcl, drs, wks, lb.	...	.33	...	.33	.27 .33
Triamylamine, drs, lcl, wks, drs lb.	...	1.01	...	1.01	... 1.01

(*FP*) Full Priority. (A) Allocation

	Current Market	1942 Low	1942 High	1941 Low	1941 High
Tributylamine, lcl, drs, f.o.b. wks ..... lb.	...	.81	.	.81	...	.81
Tributyl citrate, drs, frt all'd lb.	...	.34	.24	.34	.24	.26
Tributyl Phosphate, frt all'd lb.	...	.47	...	.47	.42	.47
Trichlorethylene, 600 lb drs, frt all'd E. Rocky Mts lb.	(*FP*)	.08	...	.08	.08	.09
Tricresyl phosphate, tech, (*FP*) ..... lb.	.25	.31	.25	.31	.22	.36½
Triethanolamine, 50 gal drs, wks ..... lb.	...	.19	...	.19	...	.19
tks, wks ..... lb.	...	.18	...	.18	...	.18
Triethylamine, lcl, drs, f.o.b. wks ..... lb.	...	1.16	...	1.16	...	1.16
Triethylene glycol, drs, wks lb.	...	.26	...	.26	...	.26
Trihydroxyethylamine Oleate, bbls ..... lb.	...	.30	...	.30	...	.30
Stearate bbls ..... lb.	...	.30	...	.30	...	.30
Trimethyl Phosphate, drs, lcl, f.o.b. dest. ..... lb.	.54	.56	.54	.56	.50	.54
Trimethylamine, c-l, drs, frt all'd E. Mississippi .... lb.	...	.85	...	.85	.85	1.00
Triphenylguanidine ..... lb.	.58	.60	.58	.60	.58	.60
Triphenyl Phosphate, drs (*FP*) ..... lb.	.31	.32	.31	.32	.33	.38
Tripoli, airfloated, bgs, wks ton	...	21.50	21.00	26.00	21.00	26.00
Turpentine (Spirits), c-l, NY dock, bbls ..... gal.	...	.74	.69¼	.82½	.45	.83
Savannah, bbls.* ..... gal.	...	.61	.55¼	.70½	.33½	.72½
Wood Steam dist, drs, c-lcl, NY ..... gal.	...	.63	.61	.80	.35	.76
tks, delv E. cities .. gal.	...	.58	.56	.72	...	...
Wood, dest dist, cl-lcl, drs, delv E. cities ..... gal.	.60	.65	.60	.70	.35	.65
tks, delv E. cities .. gal.	...	.55	.55	.58	...	...
U						
Urea, pure 112 lb cases .. lb.	...	.12	...	.12	...	.12
Fert grade, bgs, c. i. f. S.A. points ..... ton	no prices		no prices		no prices	
Dom f.o.b., wks ..... ton	...	80.00	...	80.00	...	85.00
Urea Ammonia, liq., nitrogen basis ..... ton	...	121.58	...	121.58	...	121.58
V						
Valonia beard, 42%, tannin bgs ..... ton	no prices		no prices		no prices	
Cups, 32% tannin bgs .. ton	no prices		no prices		no prices	
Extract, powd, 63% ... lb.	no prices		no prices		no prices	
Vanillin, ex eugenol, 25 lb tins, 2000 lb lots .... lb.	...	2.00	2.00	2.60	...	2.60
Ex-guaiacol ..... lb.	...	2.35	...	2.35	2.50	2.55
Ex-lignin ..... lb.	...	2.35	...	2.35	2.50	2.55
Vermilion, English, kgs .. lb.	3.12	3.17	3.12	3.17	3.12	3.17
W						
Wattle Bark, bgs ..... ton	41.00	43.00	41.00	43.00	37.50	43.00
Extract, 60°, tks, bbls .. lb.	.04475	.046	.04475	.0475	.03⅞	.05
Wax, Bayberry, bgs ..... lb.	.18	.20	.18	.20	.18	.20
Bees, bleached, white 500 lb slabs, cases ..... lb.	...	.61	.58	.61	.36½	.56
Yellow, African, bgs .. lb.	...	.49	...	.49	.30	.47
Brazilian, bgs ..... lb.	...	.50	...	.50	.31	.50
Refined, 500 lb slabs, cases lb.	.59	.60	.55	.60	.35	.52
Candelilla, bgs ..... lb.	...	.38	.33	.38	.19	.33
Carnauba, No. 1, yellow, bgs ..... lb.	.88	.89	.87	.89	.68	.88
No. 2, yellow, bgs ... lb.	.87	.88	.86	.88	.66	.85
No. 2, N. C., bgs .... lb.	.84	.85	.82	.85	.62	.79
No. 3, Chalky, bgs ... lb.	.77	.78	.75	.78	.55	.78
No. 3, N. C., bgs .... lb.	.78	.79	.77	.79	.58	.79
Ceresin, dom, bgs ..... lb.	.13½	.14	.13½	.14	.11	.14
Japan, 224 lb cases .... lb.	.40	.45	.30	.45	.16½	.35
Montan, crude, bgs .... lb.	.45	.46	.45	.46	.45	.46
Paraffin, see Paraffin Wax.						
Spermaceti, blocks, cases lb.	.26	.27	.24	.27	.24	.25
Cakes, cases ..... lb.	.27	.28	.25	.28	.25	.26
Wood Flour, c-l, bgs .... ton						
bgs, c-l, wks ..... ton	24.00	25.00	24.00	25.00	24.00	25.00
Whiting, chalk, com 200 lb	18.00	22.00	18.00	22.00	18.00	19.00
Gilders, bgs, c-l, wks .. ton	20.00	24.00	16.00	24.00	16.00	20.00
X						
Xylol, frt all'd, East 10° tks, wks ..... gal.	...	.27	...	.27	...	.29
Com'l tks, wks, frt all'd gal.	...	.27	...	.27	.26	.27
Xylidine, mixed crude, drs lb.	.35	.36	.35	.36	.35	.36
Z						
Zein, bgs, 1000 lb lots, wks ..... lb.	...	.20	...	.20	...	.20
Zinc Acetate, tech, bbls, lcl, delv ..... lb.	.16	.17	.16	.17	.15	.16
Arsenite, bgs, frt all'd .. lb.	...	.12	...	.12	.	.12
Carbonate tech, bbls, NY lb.	.14	.20	.14	.20	.14	.20
Chloride fused, 600 lb drs, wks ..... lb.	...	.05	...	.05	...	.05
Gran, 500 lb drs, wks lb.	...	.0575	...	.0575	...	.0575
Soln 50%, tks, wks 100 lb.	...	2.50	...	2.50	2.25	2.50

(*FP*) Full Priority. (*PC*) Price Control. * June 30 price.

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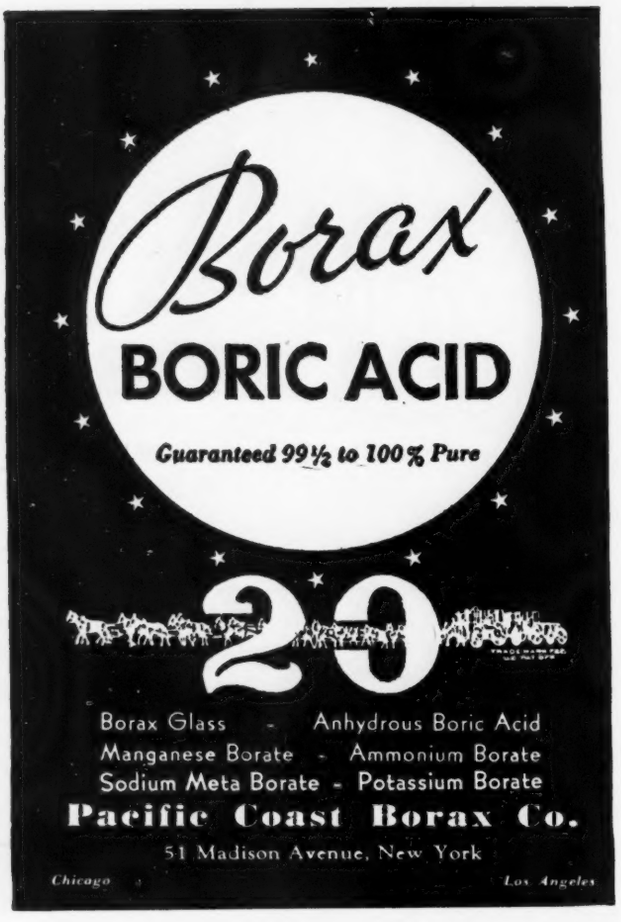

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Prices Current

		Current Market		1942 Low	1942 High	194 Low	194 High
Zinc (continued)							
Cyanide, 100 lb drs	lb.	.33	.37	.33	.37	.33	.37
Dust, 500 lb bbls, c-l, delv	lb.	...	.1035	...	.1035	.09¼	.1035
Metal, high grade slabs, c-l, NY (*FP*) (*PC*)	1000 lb.	...	8.65	...	8.65	7.65	8.64
E. St. Louis	100 lb.	...	8.25	...	8.25	7.25	8.25
Oxide, Amer, bgs, wks	lb.	...	.07¼	...	.07¼	.06½	.07¼
French 300 lb bbls, wks	lb.	...	.07¼	...	.07¼	.06¾	.07¼
Palmitate, bbls	lb.	.32	.33	.32	.33	.24½	.33
Resinate, fused, pale bbls	lb.	.11	.12	.10	.12	...	.10
Stearate, 50 lb bbls	lb.	.30	.31	.30	.31	.22	.31
Sulfate, crys, 40 lb bbls wks	lb.	...	.360	.360	.365	.315	.365
Flake, bbls	lb.	...	.410	.405	.410	.335	.405
Sulfide, 500 lb bbls, delv	lb.	...	.08½	.08	.08½	...	.08
bgs, delv (*PC*)	lb.	.14	.14¼	.14	.14¼	.08	.13¼
Sulfocarbolate, 100 lb kgs	lb.	.24	.25	.24	.29	.03⅜	.07¾
Zirconium Oxide, crude, 70-75% grd, bbls, wks	ton	75.00	100.00	75.00	100.00	75.00	100.00

Oils and Fats

Babassu, tks, futures	lb.	no prices		no prices			.06
Castor, No. 3, 400 lb drs	lb.	...	.13¾	.12½	.13¾	.0180	.12½
(*PC*) Blown, 400 lb drs	lb.	...	.15¼	.14	.15¼	.11¾	.14
China Wood, drs, spot NY	lb.	.40¼ nom.		.40⅛ nom.		.27¼	.37¼
Tks, spot NY	lb.	.3885 nom.		.3834 nom.		.26¼	.35½
Coconut, edible, drs NY	lb.	no prices		no prices		.08	.15½
Manila, tks, NY	lb.	no prices		no prices		.03⅜	.10
Tks, Pacific Coast	lb.	no prices		no prices		....	.03¼
Cod, Newfoundland, 50 gal bbls	gal.	...	.90	.85	.90	.07½	.80
Copra, bgs, NY	lb.	no prices		no prices		.0180	.04¼
Corn, crude, tks, mills	lb.	.12½	.12¾	.12½	.12¾	.06⅝	.13
Refd, 375 lb bbls, NY	lb.	.15	nom.	.15	.15½	.14¾	.16
Degras, American, 50 gal bbls, NY	lb.	.12½	nom.	.11½	.12½	.07½	.08¾
Greases, Yellow	lb.	...	.0929	...	.0929	.04¾	.08½
White, choice, bbls, NY	lb.	...	.097	...	.097	.05	.09
Lard, Oil, Edible, prime	lb.	...	.15½	...	.15½	.08½	.14½
Extra, bbls	lb.	...	.15¾	.15	.15¼	.08¼	.13¾
Extra, No. 1, bbls	lb.	...	.14⅝	.14½	.14⅝	.08	.13¼
Linseed, Raw less than 5 drs lots	lb.	...	.147	.125	.149	.091	.123
drs, c-l, spot	lb.	.139	.141	.117	.143	.095	.190
Tks	lb.	.13	.132	.108	.134	.084	.1060
Menhaden, tks, Baltimore	gal.	nom.	.666	.63¾	.666	.30	.60
Refined, alkali, drs	lb.	.124	.1280	.12	.1280	.084	.122
Kettle boiled, drs	lb.	.134	.1380	.13	.1380	.096	.132
Light pressed, drs	lb.	.1140	.1180	.11	.1180	.082	.112
Tks	lb.	.106	.108	.102	.108	.072	.10
Neatsfoot, CT, 20°, bbls, NY	lb.	nom.	.25¾	...	.25¾	.18¼	.26½
Extra, bbls, NY	lb.	nom.	.14⅞	...	.14⅞	.08¼	.14
Pure, bbls, NY	lb.	nom.	.19¼	.17¾	.19¼	.12¼	.17¾
Oiticica, bbls	lb.	.25¼	nom.	.25¼	nom.	16½	.23½
Oleo, No. 1, bbls, NY	lb.	...	.13¼	...	.13¼	.07⅜	.13¼
No. 2, bbls, NY	lb.	...	.13	...	.13	.07⅜	.13
Olive, denat, bbls, NY	gal.	4.20	4.30	4.00	4.50	2.25	4.25
Edible, bbls, NY	gal.	4.25	4.50	4.25	5.50	4.75	5.30
Foots, bbls, NY	lb.	.19½	nom.	.19	.20	.10¼	.19
Palm, Kernel, bulk	lb.	no prices		no prices		no prices	
Niger, cks	lb.	.0902	nom.	.09¼	nom.	.04¼	.09
Sumatra, tks	lb.	no prices		no prices		.02	.09
Peanut, tks, f.o.b. mill	lb.	.12⅞	.13	.12⅞	.13	.05¼	.16
Refined, bbls, NY	lb.	.17	nom.	.16¾	.17	.08	.16
Perilla, drs, N Y (A)	lb.	...	.246	...	.246	.18	.23
Tks, Coast	lb.	...	.2380	...	.2380	.16½	.21½
Pine, see Pine Oil, Chem. Sec.							
Rapeseed, blown, bbls, NY	lb.	.18	.18½	.18	.18½	.16½	.18
Denatured, drs, NY	gal.	...	nom.	...	nom.	.95	1.00
Red, Distilled, drs	lb.	.133	.143	.12¾	.143	.07¼	.13
Tks	lb.	...	.1245	.12	.12½	.06¾	.11½
Sardine, Pac Coast, tks	gal.	.66½	nom.	.66½	nom.	.39	.62½
Refined alkali, drs	lb.	.124	.128	.12	.128	...	...
Light pressed, drs	lb.	.114	.118	.11	.118	.084	.122
Tks	lb.	.106	.108	.102	.108	.078	.112
Soy Bean, crude							
Dom, tks, f.o.b. mills	lb.	.12¼	nom.	.12¼	nom.	.05¾	.12¼
Crude, drs, NY	lb.	.12¾	nom.	.13	nom.	.06¼	.12¼
Ref'd, drs, NY	lb.	.14¼	nom.	.14¼	nom.	.05½	.12¾
Tks	lb.	.13½	nom.	.13½	nom.	.07⅜	.13½
Sperm, 38° CT, bleached (*FP*) bbls, NY (A)	lb.	.1301	...	.1301	nom.	.11	.127
45° CT, blchd, bbls, NY	lb.	.1278	...	.1278	nom.	.103	.12
Stearic Acid, double pressed dist bgs	lb.	.15	.16½	.15	.16½	.09½	.13¼
Double pressed saponified bgs	lb.	.15¼	.16¾	.15¼	.16¾	.09¾	.14
Triple pressed dist bgs	lb.	.18	.19½	.18	.19½	.12½	.16½
Stearine, Oleo, bbls	lb.	...	.11	.	.11	...	.09
Tall, crude, drs, c-l, wks	ton	...	55.00	40.00	55.00	...	...
tks, wks	ton	...	40.00	30.00	40.00	...	...
dist, drs, c-l, delv	lb.	...	.05	.04	.05	...	...
tks, wks	lb.	...	.04½	.03½	.04⅝	...	...
Tallow City, extra loose	lb.	...	.097¼	...	.097¼	...	.07⅜
Edible, tierces	lb.	no prices		no prices		...	.05⅝
Acidless, tks, NY	lb.	.13	nom.	.13	nom.	.07½	.11½
Turkey Red, single, drs	lb.	...	.08¾	...	.08¾	.06½	.08¼
Double bbls	lb.	...	.12	...	.12	.09½	.11
Whale:							
Winter bleach, bbls, NY	lb.	...	.1110	...	.1110	.099	.1110
Refined, nat, bbls NY	lb.	...	.1070	...	.1070	.095	.1070

(*FP*) Full Priority. (*PC*) Price Control. (A) Allocation

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A394. Research Chemicals. Price list of fine chemicals including rare bile acids, hormones and intermediates for the preparation of sulfa drugs. George A. Breon & Co., Inc.

A395. Santopour. 10-page booklet describes a new pour-point depressant for lubricating oils. Properties, method of application, effect on properties of oils, test and service results are given. A number of curves are given to show its action in a variety of oil stocks. Monsanto Chemical Co.

A396. Services and Chemicals. 24-page brochure describes functioning of the research and consulting division of The Edwal Laboratories. The Edwal Laboratories, Inc.

A397. Tin. Report for 1941, summarizing recent researches and developments in the uses of tin in industry. Publication No. 109. Tin Research Institute.

Equipment—Containers

E681. Alloys; Bulletin No. 642-C. Discusses manganese steel for crusher, grinding mill and pulverizer parts. American Manganese Steel Division.

E682. Automatic Feed Control. New booklet entitled "Automatic Control for Mechanical Feeders on Pulverizing Machines" deals with latest electronic control which automatically regulates feeding rate in accordance with different materials and varying conditions. Max Mosher.

E683. Carbon and Graphite Equipment; Catalog Section M-8800A. Gives description and properties of carbon and graphite corrosion resistant pipe, tubes and fittings. Lists a number of chemicals being handled by these products or which laboratory tests have shown can be handled at the specified concentration and temperature. National Carbon Co., Inc.

E684. Care of Motors. A new handbook entitled "A Guide to Wartime Care of Electric Motors," takes a fresh, new slant at the subject of motor care under war conditions. It should be of considerable value to plant engineers and maintenance men. It is useful in the training of new men. Allis-Chalmers.

E685. Centrifugal Pumps; Bulletin W-312-B2C. 4-page folder describes and illustrates Type L Single Stage Volute Pumps Nos. 3 to 6 for capacities to 2000 G. P. M. and heads to 300 feet. Worthington Pump and Machinery Corp.

E686. Dryers, Bulletin No. 242. 8-page booklet describes and illustrates the McNally Vissac thermal and mechanical dryer. Discusses principles of system, operation and application. McNally Pittsburgh Manufacturing Corp.

E687. Dyestuffs; June, 1942. Contains articles on following, Package Dyeing of Cotton Yarn, Soybean Protein Fibers, Dyer of Rayon Hosiery, Evaluating Fleece Characteristics of Nanajo Sheep from a Breeding Standpoint. National Aniline Division, Allied Chemical & Dye Corp.

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E690. Fire Extinguisher; Describes product called, "No-Inferno" for extinguishing magnesium fires and incendiary bombs. The C. P. Hall Co.

E691. High Pressure; Vol. 1, No. 1. First issue of new house organ which is a successor to "Lux-Rich Reports." This new publication will present a greater number of interesting articles with larger pictures and will cover a wider scope of subjects related to carbon dioxide and other high pressure gases. Walter Kidde & Co., Inc.

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"WE"-EDITORIALLY SPEAKING

The wisdom of postponing for the duration any further "disclosures," such as the Standard of New Jersey "affair," is now further indicated by an array of stockholders' suits totalling some $100,000,000. Mr. Hitler must be doing handsprings of joy at the spectacle of United States courts listening to such litigation when every moment is precious in advancing the synthetic rubber program. If we don't win the Viennese paperhanger will make short work of both Standard of New Jersey and the stockholders, to say nothing about Mr. Arnold and Senator Truman. And the newspaper *PM* will not fare much better either.

Now that the WPB is to take over brass name plates in the salvage program may we respectfully suggest also that some "brass hats" be included?

And only a few weeks ago the Egyptians were saying "It can't happen here." Let's get going America on that salvage program. Some Americans may think it beneath their dignity to rummage around the house for old rubber, metals, including tin cans, paper, and to save grease but Mr. Hitler's stooges won't be very polite about telling us what to do about it.

Did you know that:

The number of research workers in the petroleum industry is now about 6,000? According to Benjamin T. Brooks there are 563 research workers for every 10,000 wage earners in the refining end of the business, or almost twice the ratio in the chemical industry.

We strongly urge you to read and to show to your friends who are not associated with the chemical industry the following excerpts from a report prepared by George E. Polk, special patents advisor to the National Association of Manufacturers:

"Although Arnold has led Congress and the public to believe that patents have held up the war program, the fact is that the government has long had power to have anything produced for it at any time, in war or peace, regardless of patents.

"The simple truth is that the government could have had plants built to produce synthetic rubber, aluminum, magnesium, optical instruments, chemicals or anything else it wanted, and could have used the processes covered by anybody's patent. No patent holder, if he had tried, could have stopped the government from using his patented inventions in any kind of industrial expansion for government purposes.

"Thurman Arnold and his associates in the Department of Justice are engineering one of the modern miracles of propaganda in the present attack on the patent system and industry's patent processes."

Nine major points are listed in the report's criticism of Mr. Arnold and the Justice Department, as follows:

"That they have misled Congress and the public to believe that patents have interfered with war output.

"That they have questioned property rights in patents, although court decisions for more than 100 years, without exception, have held that a patent is a property in the same sense that a house or automobile is, so that when a patented invention is taken for public use, compensation must be paid for it, as the Constitution provides with respect to property in general.

"That they have stated or implied that the patent privilege is an exception to the policy covered by the anti-trust laws, thus leaving the impression that patents create sinister monopolies not subject to government control.

"That by means of anti-trust suits, companies are being coerced to submit to consent decrees which deprive them of their legal licensing rights, thus in effect, by executive action, attempting to change the law relating to patent licensing.

"That proposals for permanent change of the patent system are being advanced as war emergency measures.

"That President Roosevelt's patent-planning commission, consisting of inventors, industrialists and others 'eminently competent to determine what permanent changes are needed in the patent system,' is being ignored.

"That cases of alleged abuse of patent rights, now the subject of anti-trust suits, are being held up as typical examples which justify the laws proposed.

"That cartels, having no legal sanction, have been ignorantly or deliberately confused with legal and beneficial patent licensing agreements.

"That the patriotism of patent holders has been attacked because they participated in the legal exchange of scientific information with other countries before the war, and obtained knowledge of processes some of which are now vital to our war effort."

All of which reminds us to remind you of the necessity of writing to your Senators in Congress your views on Bills 2303 and 2491 before it is too late. If you are not familiar with the contents of these proposals by all means secure copies at once. They are a direct threat to the very existence of the American patent system.

"We" thoroughly enjoyed reading "Rationed Rubber & What To Do About It" by Haynes and Hauser. It is too late now but in the light of what is going on in Washington perhaps a more appropriate title would have been "Political Rubber". Then perhaps our politically-minded senators and congressmen might be more inclined to read it.

Calendar of Events

July 20, Utah Paint, Varnish & Lacquer Ass'n, Monthly Meeting, Ambassador Hotel, Salt Lake City, Utah.

July 22-24, American Society of Civil Engineers, Annual Convention, Spokane, Wash.

July 27, Association of Consulting Chemists & Chemical Engineers, Inc. Council Meeting, The Chemists' Club, New York, N. Y.

Aug. 6, Indianapolis Paint, Varnish & Lacquer Assoc. Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Aug. 17, Utah Paint, Varnish & Lacquer Ass'n Monthly Meeting, Salt Lake City, Utah.

Aug. 31, Association of Consulting Chemists & Chemical Engineers, Inc. Council Meeting, The Chemists' Club, New York, N. Y.

Sept. 3, Indianapolis Paint, Varnish & Lacquer Assoc. Regular Monthly Meeting, Columbia Club, Indianapolis, Ind.

Sept. 9-11, American Water Works Assoc. Michigan Section, Park Place Hotel, Traverse City, Mich.

Sept. 17, New England Paint & Varnish Production Club; Hotel Vendome, Boston, Mass.

Fifteen Years Ago

(From Our Files of July, 1927)

Dr. E. R. Weidlein, Director of Mellon and A. I. Ch. E. president leaves for an extended trip through Europe. Kenneth H. Klipstein just returned from Europe.

Arthur C. Trask & Co. open St. Louis office.

Carbide announces that sale of ethylene glycol as an anti-freeze will be handled through National Carbon.

Monsanto Chemical announces commercial production of ortho-nitraniline.

Calco inaugurates uniform vacation plan.

Cresylic acid import duty cut 50 per cent by decision of President Coolidge.

State of Chemical Trade

Current Statistics (June 30, 1942)—p. 107

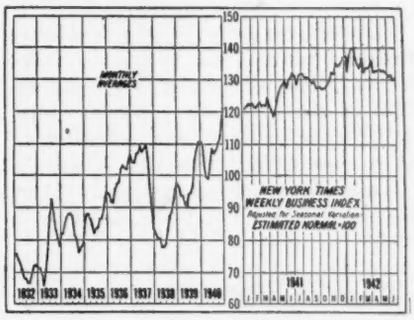
WEEKLY STATISTICS OF BUSINESS

Week Ending	Carloadings 1942	Carloadings 1941	Carloadings % of Change	Electrical Output* 1942	Electrical Output* 1941	Electrical Output* % Change	Jour. of Com. Price Index	Nat'l Chem. & Drugs	Fertilizer Fats & Oils	Ass'n Fert. Mat.	Price Indices Mixed Fert.	Price Indices All Groups	†Labor Dept. Chem. & Drug Price Index	% Steel Activity	N. Y. Times Index Bus. Act.	Fisher Commodity Index
May 30	795,756	801,783	— 0.8	3,322,651	2,954,647	+12.5	103.4	120.7	137.0	118.5	115.3	127.5	97.3	99.6	132.0	106.6
June 6	854,689	852,940	+ 0.2	3,372,374	3,076,323	+ 9.6	103.3	120.7	136.6	117.6	115.3	127.5	97.2	99.3	131.0	106.6
June 13	832,726	862,974	— 3.5	3,463,528	3,101.291	+11.7	103.6	120.7	136.6	117.6	115.3	127.1	97.2	99.3	131.4	106.5
June 20	844,913	885,539	— 4.6	3,433,711	3,091.672	+11.1	103.7	120.7	137.3	117.7	115.3	127.1	97.2	98.3	130.0	106.6
June 27	853,441	908,604	— 6.1	3,457,024	3,156,825	+ 9.5	103.6	120.7	137.0	117.8	115.3	127.3	97.2	98.0	130.2	106.7

MONTHLY STATISTICS

CHEMICAL:	April 1942	April 1941	Mar. 1942	Mar. 1941	Feb. 1942	Feb. 1941
Acid, sulfuric (expressed as 50° Baumé, short tons, Bureau of the Census)						
Total prod. by fert. mfrs.	No Longer Available		.....	.....	.....	.....
Consumpt. in mfr. fert.	.....	.....	.....	.....	.....	.....
Stocks end of month	.....	.....	.....	.....	.....	.....
Alcohol, Industrial (Bureau Internal Revenue)						
Ethyl alcohol prod., proof gal.	No Longer Available		.....	.....	.....	.....
Comp. denat. prod., wine gal.	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal.	.....	.....	.....	.....	.....	.....
Spec. denat. prod., wine gal.	.....	.....	.....	.....	.....	.....
Removed, wine gal.	.....	.....	.....	.....	.....	.....
Stocks end of mo., wine gal.	.....	.....	.....	.....	.....	.....
Ammonia sulfate prod., tons a	70,153	57,916.5	65,216	64,524	58,592	58,360
Benzol prod., gal. *b*	No Longer Available				12,040,997	11,765,359
Byproduct coke, prod., tons a	5,058,799	5,068,799	5,199,728	4,999,309	4,715,585	4,502,091
Cellulose Plastic Products (Bureau of the Census)						
Nitrocellulose sheets, prod., lbs.	983,607	927,399	1,006,242	844,819	922,605	720,173
Sheets, ship., lbs.	1,017,634	819,485	984,379	794,199	1,050,319	755,513
Rods, prod., lbs.	321,667	356,179	296,100	368,429	319,840	314,560
Rods, ship., lbs.	337,315	342,448	269,593	342,024	350,342	299,793
Tubes, prod., lbs.	109,593	136,048	131,920	99,345	134,158	97,399
Tubes, ship., lbs.	171,548	104,665	139,591	96,298	144,426	89,831
Cellulose acetate, sheets, rod, tubes						
Production, lbs.	567,799	402,492	519,357	464,601	566,575	343,605
Shipments, lbs.	588,458	408,252	486,470	372,804	504,428	335,009
Molding comp., ship.; lbs.	3,460,615	2,102,084	3,444,374	1,990,982	3,224,519	1,641,978
Methanol (Bureau of the Census)						
Production, crude, gals.	No Longer Available		.....	.....	.....	.....
Production, synthetic, gals.	.....	.....	.....	.....	.....	.....
Pyrozylin-Coated Textiles (Bureau of the Census)						
Light goods, ship., linear yds.	3,836,777	4,223,849	3,972,491	3,806,132	4,069,499	3,466,902
Heavy goods, ship., linear yds.	2,852,024	3,326,482	2,679,692	3,294,035	2,228,561	3,032,393
Pyroxylin spreads, lbs. *c*	5,669,485	7,164,760	5,403,335	6,759,108	5,472,578	6,262,184
Exports (Bureau of Foreign & Dom. Commerce)						
Chemicals and related prod. *d*	Exports and Imports No Longer Available				.....	.....
Crude sulfur *d*	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Imports						
Chemicals and related prod. *d*	.....	.....	.....	.....	.....	.....
Coal-tar chemicals *d*	.....	.....	.....	.....	.....	.....
Industrial chemicals *d*	.....	.....	.....	.....	.....	.....
Employment (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	157.0	135.9	158.2	131.6	153.0	128.5
Other than petroleum	163.1	139.6	164.8	134.6	158.7	130.8
Chemicals	192.9	162.4	192.5	159.3	188.1	155.1
Explosives	No Longer Available				Not Available	
Payrolls (U. S. Dept. of Labor, 3 year av., 1923-25 = 100) Adjusted to 1937 Census Totals						
Chemicals and allied prod., including petroleum	220.6	158.5	218.9	149.1	208.8	144.8
Other than petroleum	233.8	163.4	231.1	154.0	218.3	148.7
Chemicals	293.4	208.3	287.8	201.7	278.3	143.9
Explosives	No Longer Available				Not Available	
Price index chemicals*	96.4	86.4	96.4	85.9	96.3	85.7
Drugs & Pharmaceuticals*	126.7	97.5	126.5	97.2	126.5	96.9
Fert. mat.*	79.3	71.0	79.5	70.4	79.3	70.4
Paint and paint mat.	100.6	88.7	100.8	87.4	99.9	86.6
FERTILIZER:						
Exports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials	Exports and Imports No Longer Available				.....	.....
Total phosphate rock	.....	.....	.....	.....	.....	.....
Total potash fertilisers	.....	.....	.....	.....	.....	.....
Imports (long tons, Nat. Fert. Association)						
Fertiliser and fert. materials	.....	.....	.....	.....	.....	.....
Sodium nitrate	.....	.....	.....	.....	.....	.....
Total potash fertiliser	.....	.....	.....	.....	.....	.....

INDUSTRIAL TRENDS



Business: According to the Federal Reserve Board's index of industrial production activity continued to advance in May and June. The index was placed at 173 in April 176 in May and about 180 in June. Increases came from industries which are now making products chiefly for military purposes. In contrast to the Federal Reserve Board index the *New York Times* weekly business index declined from 132.3 for week ending May 23 to 129.3 for week ending July 4. Gains were made in carloadings and electric power but were offset by losses in steel production, paperboard and lumber.

Steel: Production was maintained at about 98.2% of capacity in May and about 96.4% in June. The scrap problem is giving serious concern as it is felt that the industry cannot continue its high rate unless the required scrap is provided. Usually this is the season for extensive collections, but as yet no definite step-up in gathering has been apparent. The nation-wide campaign by the steel industry to bring out dormant scrap is scheduled to start at the end of July.

Electric Production: Electric energy distributed by the light and power industry for the week ended July 4 was 3,424,188,000 kwh. This represents an increase of 17.9% over the corresponding week of last year. All sections of the country shared in the gains with the Pacific Coast, Southern and Middle Atlantic states maintaining the most impressive improvement.

Carloadings: Loadings in May increased by about the usual seasonal amount. During June loadings were slightly less than same period a year ago. Loading in first twenty-five weeks

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of this year totaled 20,206,564 as compared with 18,942,128 in corresponding 1941 period, an increase of 6.7%. In spite of earlier doubts it is now believed that the railroads will be able to meet expected peak of about 1,000,000 cars a week this fall. Efficiency has been markedly increased. Cars are now turned around much more quickly and loaded more fully.

Automotive: According to the Automotive Branch of the WPB war shipments from companies representing 72% of the automotive industry were 46% greater in April than in February. It is now agreed that the industry's conversion to war production is "over the hump" and that deliveries will rapidly increase.

Construction: According to F. W. Dodge Corp. value of construction contract awards increased sharply in May, following a decline in the previous month. Awards for publicly financed work increased in May and constituted about seventy-five per cent of the total. Residential building contracts continued to decline.

Commodity Prices: Wholesale and retail prices showed little change after the general maximum price regulation went into effect. The Bureau of Labor Statistics Index of about 900 commodities has varied less than 1% in three months. It is however, still 13% higher than it was a year ago. Since July, 1939, the price level has risen 31%.

Retail Trade: The war has begun to affect retail trade adversely. Department store sales were down about 7% in May. Retail trade during June in dollar volume was about the same as last year but as prices are up about 17% this actually represents a sharp decline in unit sales.

Outlook: Production of war material is rapidly expanding while trend in production of civilian goods is steadily declining. This is strikingly shown by a study of the Federal Reserve Board index of industrial production. In June 1941, this index stood at 159 at which time civilian production outranked war production by a ratio of 127 to 32. Since then conversion has carried war output to 88 while bringing civilian points down to 92 for a total index of 180. With the production preparatory stage now completed, raw materials are becoming the limiting factors. Therefore this shift in ratio is likely to continue at an accelerating pace.

MONTHLY STATISTICS (cont'd)

	April 1942	April 1941	Mar. 1942	Mar. 1941	Feb. 1942	Feb. 1941
FERTILIZER: (Cont'd)						
Superphosphate e (Nat. Fert. Association)						
Production, total	381,619	330,113	.....	.....	402,160	334,697
Shipments, total	805,942	1,066,191	.....	.....	582,594	350,343
Northern area	407,551	509,920	.....	.....	201,212	129,961
Southern area	398,391	556,271	.....	.....	381,382	220,382
Stocks, end of month, total	.....	.....	.....	.....	1,636,086	1,967,724
Tag Sales (short tons, Nat. Fert. Association)						
Total, 17 states	.....	.....	1,155,809	1,487,101	1,088,923	858,255
Total, 12 southern	.....	.....	1,062,473	1,367,307	1,006,150	765,196
Total, 5 midwest	.....	.....	93,336	119,794	82,773	93,059
Fertilizer employment *i*	152.8	178.7	165.6	140.9	159.1	113.2
Fertilizer payrolls *i*	177.1	176.9	175.9	116.9	155.4	92.8
GENERAL:						
Acceptances outst'd'g *f*	.....	.....	.....	.....	$190	$211
Coal prod., anthracite, tons	.....	.....	.....	.....	4,772,000	4,430,000
Coal prod., bituminous, tons	.....	.....	.....	.....	43,840,000	41,450,000
Com. paper outst'd'g *f*	.....	.....	$384	$263	$388	$240
Failures, Dun & Bradstreet	.....	.....	1,048	1,211	916	1,129
Factory payrolls *i*	186.6	134.7	182.9	131.2	178.2	126.8
Factory employment *i*	136.1	122.6	135.0	119.9	133.6	117.8
GENERAL MANUFACTURING:						
Automotive production	.....	.....	94,510	507,834	134,134	485,622
Boot and Shoe prod., pairs	45,266,292	45,105,652	45,105,652	43,153,556	40,006,504	38,005,922
Bldg. contracts, Dodge *j*	.....	.....	$610,799	$479,903	$433,557	$270,373
Newsprint prod., U. S. tons	.....	.....	80,923	87,376	76,234	79,720
Newsprint prod., Canada, tons.	.....	.....	295,835	275,769	278,101	245,607
Glass containers, gross‡	6,921,000	3,325,000	6,935,000	5,128,000	5,966,000	4,381,000
Plate glass prod., sq. ft.	.....	.....	5,564,717	18,266,400	5,600,379	15,664,200
Window glass prod., boxes	.....	.....	1,583,000	1,417,000	1,457,000	1,397,000
Steel ingot prod., tons	7,122,313	6,754,179	7,392,911	7,124,003	6,521,056	6,230,354
% steel capacity	96.3	97.6	98.2	99.6	96.0	96.5
Pig iron prod., tons	.....	.....	.....	.....	4,502,273	4,197,873
U.S. cons'pt. crude rub., lg. tons	No longer Available				.....	.....
Tire shipments	.....	.....	1,027,021	5,517,255	1,115,950	4,896,340
Tire production	.....	.....	1,156,410	5,685,559	1,112,907	5,161,267
Tire inventories	.....	.....	4,809,123	10,148,861	4,552,702	10,028,803
Cotton consumpt., bales	998,754	920,950	966,631	854,767	893,745	793,428
Cotton spindles oper.	23,100,202	22,787,396	23,096,479	22,806,104	23,077,722	22,769,368
Wool consumption *s*	52.0	52.8	52.9	53.0	47.6	47.0
Rayon deliv., lbs.	37,600,000	38,700,000	39,900,000	35,400,000	36,000,000	31,600,000
Rayon employment *i*	310.3	317.9	313.2	312.2	312.6	311.0
Rayon payrolls *i*	387.6	342.3	394.4	332.9	391.3	327.6
Soap employment *i*	92.3	91.6	92.6	90.7	91.6	89.8
Soap payrolls *i*	136.9	115.6	137.3	114.8	135.1	112.6
Paper and pulp employment *i*	129.7	120.3	129.7	118.5	129.5	117.3
Paper and pulp payrolls *i*	171.9	139.1	175.7	136.4	174.0	132.5
Leather employment *i*	95.1	90.0	97.6	89.1	97.3	88.1
Leather payrolls *i*	122.1	95.1	123.7	94.3	122.3	92.3
Glass employment *i*	125.8	121.8	126.1	119.5	126.0	115.8
Glass payrolls *i*	164.1	143.5	165.4	140.5	171.2	135.3
Rubber prod. employment *i*	94.3	105.0	98.9	102.8	99.0	100.7
Rubber prod. payrolls *i*	129.7	122.3	132.3	119.5	127.4	115.3
Dyeing and fin. employment *i*	138.2	143.3	138.3	142.0	136.8	139.7
Dyeing and fin. payrolls *i*	156.5	134.7	151.7	133.3	148.8	128.8
MISCELLANEOUS:						
Oils & Fats Index ('26 = 100)[1]	.....	.....	.....	93.7	.....	83.6
Gasoline prod., *p*	47,528	53,768	52,902	53,409	51,612	48,374
Cottonseed oil consumpt., bbls.	.....	.....	225,288	317,622	254,778	298,781
PAINT, VARNISH, LACQUER, FILLERS:						
Sales 580 establishments, dollars	$50,530,225	$51,963,528	$48,070,117	$40,185,294	$45,175,827	$33,690,870
Trade sales (580 estbts.) dollars	$25,839,940	$27,972,286	$23,718,650	$19,565,515	$22,126,413	$15,767,081
Industrial sales, total, dollars	$19,009,421	$19,266,308	$18,897,968	$17,033,354	$17,618,656	$14,973,684
Paint & Varnish, employ. *i*	139.0	137.4	140.7	132.9	141.1	128.6
Paint & Varnish, payrolls *i*	177.4	157.9	179.4	147.4	176.4	141.7

a Bureau of Mines; *b* Crude and refined plus motor benzol, Bureau of Mines; *c* Based on 1 lb. of gun cotton to 7 lbs. of solvent, making an 8-lb. jelly; *d* 000 omitted, Bureau of Foreign & Domestic Commerce; *e* Expressed in equivalent tons of 16% A.P.A.; *f* 000,000 omitted at end of month; *i* U. S. Dept. of Labor, 3 year average, 1923-25 = 100, adjusted to 1937 Census totals; *j* 000 omitted, 37 states; *p* Thousands of barrels, 42 gallons each; *q* 680 establishments, Bureau of the Census; *r* Classified sales, 580 establishments, Bureau of the Census; *s* 53 manufacturers, Bureau of the Census, in millions of lbs.; *t* 387 identical manufacturers, Bureau of the Census, quantity expressed in dozen pairs; *v* In thousands of bbls., Bureau of the Census; ** Indices, Survey of Current Business, U. S. Dept. of Commerce; *z* Units are millions of lbs.; ‡ 000 omitted; * New series beginning March, 1940; [1] Revised series beginning February, 1940.

U. S. I. Nets $1,996,077

U. S. Industrial Alcohol Co. and subsidiaries in report for fiscal year ended March 31, 1942 show net profit of $1,996,077 after depreciation, federal income taxes of $1,950,000 and provision of $1,500,000 for contingencies. Net is equal to $5.30 a share on 376,836 shares of capital stock, excluding 14,402 shares in treasury. No liability for federal excess profits tax was incurred, the report states.

This compares with net profit for year ended March 31, 1941, after provision of $275,000 for federal income taxes, of $836,305, equal to $2.14 a share on 391,238 shares.

Atlas Powder Nets $322,973

Atlas Powder Co. and subsidiaries in report for quarter ended March 31, 1942, show net profit of $322,973 after depreciation and provision of $1,202,399 for federal income and excess profits and capital stock taxes. Above net is equal, after dividend requirements on 5% preferred stock, to 93 cents a share on 254,827 no-par shares of common stock. Provision for federal taxes includes $225,000 for anticipated increase in tax rates.

This compares with net profit for quarter ended March 31, 1941 of $440,282, equal to $1.41 a share on 252,278 common shares, when federal taxes were $1,046,000.

Air Reduction Shows Net of $1,495,548

Air Reduction Co., Inc. and wholly-owned subsidiaries in report for quarter ended March 31, 1942, show net profit of $1,495,548 after depreciation, provision of $2,317,711 for federal income and excess profits taxes and $525,000 for contingencies. Net is equal to 55 cents a share on 2,713,337 shares of capital stock.

This compares with adjusted profit for quarter ended March 31, 1941, after providing $1,591,266 for federal income and excess profits, of $1,590,251, equal to 58 cents a share on 2,711,137 shares.

Amer. Agric. Chem. Pays $1.86 a Share

American Agricultural Chemical Co. of Delaware and subsidiaries in report for nine months ended April 2, 1942, show net profit of $1,169,983 after depreciation, depletion, federal income taxes, etc., equal to $1.86 a share on 627,969 shares of capital stock Company states no provision for excess profits taxes was necessary.

This compares with $153,206 equal to 24 cents a share for the nine months ended April 3, 1941.

NOPCO Earns $4.11 A Share

National Oil Products Co. and subsidiaries in report for year ended December 31, 1941, show net profit of $869,373 after depreciation, interest, federal income and excess profits taxes, but exclusive of company's interest in profits of Galen Co. which is approximately 79% owned by National Oil Products, comparing with $697,585 in 1940.

Including interests in profits of Galen Co. consolidated profit of National Oil Products for 1941 was $887,273, equal to $4.11 a share on 215,794 shares (par $4) of common stock outstanding at close of year.

This compares with consolidated net profit of $704,967, or $3.92 a share on 179,829 shares in 1940.

Provision for federal normal income and excess profits taxes for the company and its subsidiaries for year 1941 amounted to $1,006,719, compared with $234,240 for 1940.

General Aniline Earns $4,115,731

General Aniline & Film Corp. in report for year ended December 31, 1941, certified by independent auditors, shows consolidated net income of $4,115,731 after interest, federal income and excess profits taxes, etc., equal under the participating provisions of the shares, to $5.61 a share on 529,271 no-par shares of Class A common and 56 cents a share on 2,050,000 shares (par $1) of Class B common stocks. The company made no sales of securities during the year.

This compares with net income of $4,106,057, or $5.59 a share on 529,271 shares of Class A stock and 55 cents a share on 2,050,000 shares of Class B stock in 1940.

Dividends and Dates

Name	Per Share	Stock Record	Payable
Air Reduction Co., Com., (quar.)	.25	7-6	7-15
Extra	.25	7-6	7-15
Aluminum Co. of Amer. 6% pref. (quar.)	1.50	6-15	7-1
Amer. Agricultural Chem Co.	.30	6-16	6-30
Amer. Cyanamid Co. Class A, (quar.)	.15	6-12	7-1
Class B, (quar.)	.15	6-12	7-1
5% pref. (quar.)	1.25	6-12	7-1
Amer. Potash & Chem. Corp.(irreg.)	.75	6-26	6-30
Amer. Smelting & Refining, Com.	.50	8-7	8-31
7% 1st pref. (quar.)	1.75	7-3	7-31
Armour & Co. (Del.) 7% pref. (quar.)	1.75	6-15	7-1
Armour & Co. (Ill.) $6 prior pref. (quar.)	1.50	6-15	7-1
Carey (Philip) Mfg. Co. (irreg.)	.15	6-24	6-30
Chemical Fund, Inc.	.07	6-30	7-15
du Pont (E. I.) de Nemours & Co. $4.50 pref. (quar.)	1.125	7-10	7-25
Hercules Powder Co., 6% pref. (quar.)	1.50	8-4	8-15
Hooker Electrochemical Co., 6% pref. (quar.)	1.50	6-12	6-30
Internat. Nickel Co. of Canada Com. payable in U.S. Funds	.50	6-1	6-30
7% pref. (quar.)	1.75	7-2	8-1
7% pref. ($5 par.) (quar.)	.0875	7-2	8-1
Monroe Chemical Co. $3.50 pref.(quar.)	.875	6-13	7-1
Mutual Chem. Co. of America 6% pref. (quar.)	1.50	9-17	9-28
6% pref. (quar.)	1.50	12-17	12-28
Parke Davis & Co.	.30	7-15	7-31
Pfaudler Co. (quar.)	.50	6-19	7-1
Extra	1.00	6-20	7-1
So. Acid & Sulphur 7% pref. (quar.)	1.75	6-10	7-1
So. Phosphate Corp (reduced)	.10	6-16	6-30
Squibb (E.R.) & Sons $5 pref. Series A (quar.)	1.25	7-15	8-1
Standard Chem. Co. (Interim)	.75	6-30	7-30
United Carbon Co.	.75	6-16	7-1
U.S. Industrial Alcohol Co. (quar)	.25	7-15	8-1

Gross sales in 1941 amounted to $41,387,403 against $28,211,498 in preceding year.

Rayonier, Inc. Earns $3,762,970

Rayonier, Inc. (pulp and paper) and wholly-owned subsidiary in report for fiscal year ended April 30, 1942, certified by independent auditors, show net profit of $3,762,970 after depreciation, depletion, interest, federal income and excess profits taxes of $5,600,000, etc., equal after dividends on $2 cumulative preferred stock, to $2.60 a share (par $1) on 963,871 shares of common stock.

This compares with $4,005,871 or $2.86 a common share in preceding year, when federal income and excess profits taxes amounted to $3,550,000. Net sales for the year totaled $31,316,906 against $25,154,297.

Current assets as of April 30, 1942, amounted to $10,405,436 and current liabilities were $5,403,353 comparing with $10,007,745 and $5,058,878 respectively on April 30, 1941.

Price Trend of Representative Chemical Company Stocks

	June 1	June 6	June 13	June 20	Net gain or loss last mo.	Price on June 21, 1941	1942 High	1942 Low
Air Reduction Co.	31⅞	32¾	31¼	31⅝	— ¼	42½	38¼	29½
Allied Chemical & Dye Corp.	129	134	134½	135½	+ 6½	152	149	118½
Amer. Agric. Chem.	20	21	20	20⅞	+ ⅞	18	25⅝	19
Amer. Cyanamid "B"	31½	35⅛	33	34	+ 2½	37¾	41⅞	28⅝
Columbian Carbon	65	70	70⅜	69	+ 4	79¾	72	51
Commercial Solvents	8	8½	8¼	8¼	+ ¼	10⅛	9¾	7¼
Dow Chemical Co.	102⅛	109¾	111	113½	+11⅜	125	124¼	95
duPont	108¼	112⅞	113½	114⅛	+ 5⅞	152½	144	102¾
Hercules Powder	58	61	58	59	+ 1	71½	72	51
Mathieson Alkali Works	21⅞	21½	21½	22	+ ⅛	28⅝	29½	20
Monsanto	69	71¼	76	75	+ 6	81½	91	66
Standard Oil of N. J.	35¼	35	34½	35⅜	+ ⅛	39¼	42¼	30½
Texas Gulf Sulphur	29½	30½	31¼	30½	+ 1	35¼	34⅞	28
Union Carbide & Carbon	63¾	64¾	64⅞	65½	+ 1¾	71⅜	74¾	58
United Carbon Co.	42½	45½	44½	45½	+ 3		45½	37
U. S. Industrial Alcohol	25½	26⅝	26⅛	25¼	— ¼	24⅞	34¼	24½

Chemical Finances
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Chemical Stocks and Bonds

PRICE RANGE 1942 June Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Stocks	Par $	Shares Listed	Dividends 1941*	Earnings** $-per-share-$ 1941	1940	1939
NEW YORK STOCK EXCHANGE													
43½	49⅞	37	55⅝	46	70¼	49¼	Abbott Labs.	No	755,204	1.60	2.90	2.89	2.61
36¼	38¼	29½	45	34⅝	58⅛	36½	Air Reduction	No	2,736,855	2.00	2.62	2.38	1.98
132	149	118½	167½	135	182	135½	Allied Chem. & Dye	No	2,401,288	6.00	9.67	9.43	9.50
18¾	23⅝	19	22⅞	14⅜	21	12⅛	Amer. Agric. Chem.	No	627,981	1.45	1.79	1.45	1.22
30	35	27⅜	36	26	35½	23	Archer-Dan.-Midland	No	545,416	1.85	5.69	5.42	3.02
45	70	43	73¾	61	80½	57	Atlas Powder Co.	No	254,827	4.50	6.13	5.71	3.82
115	116	111	121	111	124⅝	112½	5% conv. cum. pfd.	100	68,597	5.00	27.77	26.01	18.94
18½	21¼	15	20⅝	18½	35⅛	20	Celanese Corp. Amer.	No	1,376,551	2.00	3.43	2.90	3.53
118	120⅝	110	122½	116¾	121	105½	prior pfd.	100	164,818	7.00	35.08	38.69	38.67
13¼	14⅛	11⅛	16¼	10⅞	20	10⅛	Colgate-Palm.-Peet	No	1,962,087	0.50	3.09	1.62	2.74
65⅝	72	51	83	64	98⅝	71	Columbian Carbon	No	537,406	4.70	6.57	5.71	5.32
8⅛	9⅜	7¼	11⅞	7½	16⅝	8	Commercial Solvents	No	2,636,878	0.55	.99	.91	.61
49⅝	55⅞	42¼	55⅞	42¼	65⅛	40¼	Corn Products	25	2,530,000	3.00	3.37	3.10	3.32
170½	174	159	183½	164	184	165	7% cum. pfd.	100	245,738	7.00	41.78	7.23	7.70
17	21	14	21	12¼	23¼	12½	Devoe & Rayn. A.	No	95,000	1.00	7.08	1.14	2.08
112¼	124¼	95	141⅝	111⅛	171	127¼	Dow Chemical	No	1,135,187	3.00	6.58	6.65	3.76
113⅞	144	102⅝	164⅝	125¼	180¼	146⅛	DuPont de Nemours	20	11,065,762	7.00	7.50	7.23	7.70
121⅝	126½	120	127	120⅞	129⅝	114	4½% pfd.	No	1,688,850	4.50	53.53	51.48	52.25
129⅝	141	108	145⅜	120¼	166⅝	117	Eastman Kodak	No	2,488,242	6.00	8.57	7.96	8.55
170½	176	170	183⅛	160	180	155	6% cum.	100	61,657	6.00	350.14	325.62	337.65
30	38⅜	27	41	32½	39¼	24⅝	Freeport Sulphur	10	796,380	2.00	3.95	3.81	2.76
4	5⅜	4	7½	4⅞	10	5½	Gen. Printing Ink	1	735,960	0.65	1.00	.86	.94
13⅞	15	12½	17⅞	11	19⅝	11	Glidden Co.	No	829,989	1.50	3.08	1.56	1.70
40	44	37⅜	46	35	45	39	4½% cum. pfd.	50	199,940	2.25	15.08	8.64	9.27
80	93½	79¼	98	76	113¼	89⅞	Hazel Atlas	25	434,409	5.00	6.63	5.98	6.60
57½	72	51	80¼	65¼	100½	69	Hercules Powder	No	1,316,710	3.00	4.23	4.01	3.65
128	132	125	132½	132½	133½	126¼	6% cum. pfd.	100	96,194	6.00	69.71	66.38	60.87
23¼	27	21	29⅝	20¾	29	16⅝	Industrial Rayon	No	759,325	2.50	3.04	3.51	1.77
21	23½	19¾	27	19	47⅝	21¼	Interchem.	No	290,320	1.60	6.01	2.47	4.16
109	111½	103	113¾	107	113	91	6% pfd.	100	65,661	6.00	32.79	16.99	24.27
5⅝	6¼	3½	..	..	..	..	Intern. Min. & Ch.	5	473,981	...	...	...	...
43¾	45	38	..	..	..	..	4% cum. pfd.	100	100,000	...	...	...	...
25⅝	28¾	24⅛	31⅝	23	38⅞	19⅝	Intern. Nickel	No	14,584,025	2.00	2.22	2.30	2.39
41½	48¼	39	49	38¼	39⅝	26⅞	Intern. Salt	No	240,000	3.00	3.76	3.98	1.92
18⅝	20⅜	17½	22	17¼	23¾	14⅜	Kellogg (Spencer)	No	509,213	1.70	3.66	2.74	1.30
24½	26¼	20½	45⅜	19⅛	53⅝	30	Libbey Owens Ford	No	2,513,258	3.50	3.52	3.97	3.21
13¼	15½	11⅜	16⅝	13	18⅝	10⅛	Liquid Carbonic	No	728,100	1.00	2.92	2.21	1.62
21	29½	20	31¾	24⅛	33⅝	21	Mathieson Alkali	No	828,171	1.50	1.99	1.72	1.12
75⅛	91	66	94	77	119	79	Monsanto Chem.	No	1,241,816	3.00	4.99	4.38	4.01
114	117½	110	118⅝	112	119	110	4½% pfd. A.	No	50,000	4.50	38.43	57.38	54.29
115	119	112	123	115	122	113¼	4½% pfd. B.	No	50,000	4.50	38.43	57.38	54.29
106½	110¾	102½	113⅜	106⅞	...	...	4 % pfd. C.	No	50,000	4.50	38.43	...	...
13⅛	16¼	11⅞	19¾	12¾	22½	14¼	National Lead	10	3,090,664	0.50	1.19	1.34	1.23
157	168	145	170	160½	170	160	7% cum. "A" pfd.	100	213,793	7.00	24.68	28.54	27.04
131¾	146	129	154	138	158⅝	132	6% cum. "B" pfd.	100	103,277	6.00	49.99	59.46	55.39
33½	35	29½	30	26	44	23⅝	National Oil Products	4	179,329	1.95	4.11	3.92	3.89
7⅞	11⅜	7¼	11⅞	5⅝	14¼	6¼	Newport Industries	1	621,359	0.75	1.14	0.50	0.66
49¼	54	43¼	54	38⅜	64⅝	43	Owens-Illinois Glass	12.50	2,661,204	2.50	3.40	2.71	3.17
46½	52	42	61⅛	47½	71⅝	53	Procter & Gamble	No	6,409,418	2.00	4.20	4.37	3.80
46⅞	52	42	120	115	118½	112¾	5% pfd.	100	169,517	5.00	324.38	336.78	298.55
12⅜	14⅜	10⅛	16⅜	10⅛	13⅛	7⅝	Shell Union Oil	No	18,070,625	1.00	1.33	1.05	0.77
21¼	28⅛	19⅜	25⅛	18⅞	23¼	12¾	Skelly Oil	No	981,349	1.50	6.03	3.28	1.99
23⅝	27½	20	34⅛	24⅞	29	20⅜	S. O. Indiana	25	15,272,020	1.00	3.17	2.20	2.24
35	42¼	30½	46⅞	33	46⅛	30⅞	S. O. New Jersey	25	27,278,666	1.00	5.15	4.54	3.27
8⅛	9⅝	7½	9⅝	6	9¼	4¼	Tenn. Corp.	5	853,696	1.00	1 00	1.36	0.41
34½	39¼	30	40⅝	34½	47⅝	33	Texas Corp.	25	10,876,882	2.00	4.77	2.90	3.02
30¾	34⅞	28	36⅞	30½	37¼	26⅞	Texas Gulf Sulphur	No	3,840,000	2.50	2.35	2.38	2.04
65½	74¾	58	79⅝	60	88⅝	50⅝	Union Carbide & Carbon	No	9,277,288	3.00	4.53	4.55	3.86
43¼	45½	37	53	35	65⅝	42½	United Carbon	No	397,885	3.00	4.30	3.24	3.81
26⅛	34¼	24½	34¼	20	28	14	U. S. Indus. Alcohol	No	391,238	1.00	...	2.73	1.06
15	20⅞	14¼	24⅛	15½	43⅞	26	Vanadium Corp. Amer.	No	405,706	1.50	3.63	2.85	3.25
20¼	25½	18⅝	27¼	20	31½	14	Victor Chem.	5	750,000	1.40	1.59	1.57	1.59
1⅞	2⅛	1	3½	⅝	4¼	1⅝	Virginia-Caro. Chem.	No	486,122	...	—1.89	—1.36	—1.57
31⅞	33½	22½	29½	18⅞	31⅝	14	6% cum. part. pfd.	100	213,052	1.00	1.69	2.89	2.41
25	31½	22	36½	27¼	36½	27⅝	Westvaco Chlorine	No	553,132	1.85	2.92	2.96	2.91
104	106½	100½	113	105	109⅞	106	cum. pfd.	No	58,415	4.50	22.19	21.98	...
NEW YORK STOCK EXCHANGE													
33¾	41⅞	28⅝	43⅝	31	39⅞	26	Amer. Cyanamid "B"	10	2,618,387	0.60	2.42	2.44	2.07
7⅜	7⅝	6⅞	7⅝	6⅜	8⅛	5	Duval Texas Sulphur	No	500,000	1.25	1.42	1.16	1.25
69½	88½	67½	99	65	92	60	Heyden Chem. Corp.	100	104,983	3.00	9 04	7.86	5.98
69⅜	70	55¼	96¼	55	104	65	Pittsburgh Plate Glass	25	2,188,040	5.00	6.82	6.30	4.94
72⅛	73¼	59⅜	84	61	100	62½	Sherwin Williams	25	638,927	3.00	7.83	6.57	5.96
114½	115	110	115½	106½	114⅝	106	5% cum. pfd.	50	122,289	5.00	47.82	39.49	35.08
PHILADELPHIA STOCK EXCHANGE													
135	175½	125	185	162	192	158¾	Pennsylvania Salt	50	150,000	8.00	10.99	11.51	8.63

PRICE RANGE 1942 June Last	1942 High	1942 Low	1941 High	1941 Low	1940 High	1940 Low	Bonds	Date Due	Int. %	Int. Period	Outstanding $
NEW YORK STOCK EXCHANGE											
102	104¼	101¾	104½	100⅝	105¼	100¾	Amer. I. G. Chem. Conv.	1949	5½	M-N	$22,400,000
43	43	34	42¼	26½	41	27⅞	Anglo Chilean Nitrate inc. deb.	1967	4½	J	10,400,000
43¾	43¾	35	40	25⅝	39⅝	27	Lautaro Nitrate inc. deb.	1975	4	J-D	27,200,000
97	97⅞	95¾	99⅞	94¾	100¼	93½	Shell Union Oil	1954	2½	J-J	$5,000,000
104¼	105½	103	106⅜	102⅜	107	101⅛	Standard Oil Co. (New Jersey) deb.	1961	3	J-D	$5,000,000
104⅜	105⅝	103⅜	150⅝	103	107	100⅝	Standard Oil Co. (New Jersey) deb.	1953	2¾	J-J	$0,000,000
105¾	105¾	104½	107⅜	102⅞	108¼	102	Texas Corp.	1950	3	A-O	40,000,000

* Including extras paid in cash.
** For either fiscal or calendar year.
x New stock.

New Trade Marks of the Month

Supermix
396,239

B-G-PHOS
408,512

E-Z SPEEDY
450,309

451,440

451,855

EASTMAN CELLULOSE ACETATE
416,224

DRIER-OUTER
450,378

EZEMIX
396,244

AMPRUF
441,299

450,439 451,996

Vi-Chocolin
451,511

451,856

REDIMIX
396,245

KELITE
451,681

SANI-SOFT
451,869

HOLD-TITE
396,247

442,360

MAGNECHROME
450,611

DERMULSION
451,743

Intelin
451,896

CLEARSIZE
396,249

SCOUT
449,948

DURFERRIT
450,732

SWING
451,768

TANNODIN
451,915

STOVGLAZ
396,261

PIONITE
450,144

CASCOLAC
451,440

Ferri-Cl3or
451,842

PROTEK-SORB
451,965

Frosst
396,263

=Perm-O-Line=
451,139

451,854

COOK LABORATORIES,INC.
396,265

RinsiLK "A MINUTE RINSE"
450,244

X-PANDOSEAL
451,252

FOSECO
451,972

Trade Mark Descriptions †

396,239. General Electric X-Ray Corp.; Chicago, Ill.; Jan. 29, '41; for chemicals for developing and fixing x-rays; since Jan. 20, '41.

396,244. General Electric X-Ray Corp.; Chicago, Ill.; Apr. 25, '41; for chemicals for fixing x-rays; since Feb. 6, '40.

396,245. General Electric X-Ray Corporation; Chicago, Ill.; Apr. 25, '41; for chemicals for developing x-rays; since Feb. 6, '40.

396,247. Lucas Kiltone Co.; Philadelphia, Pa.; May 15, '41; for insecticides and fungicides; since Apr. 15, '41.

396,249. National Starch Products, Inc.; New York, N Y.; May 20, '41; for laundry starches; since Mar. 15, '41.

396,261. Lavinia P. Crocker, doing business as Pingo Company, Boston, Mass.; Dec. 18, '41; for liquid chemical preparation for application to stoves for the purpose of sealing the pores and providing a protective waterproof non-rusting surface; since Mar. '40.

396,263. Charles E. Frosst & Co.; Montreal, Quebec, Canada; Jan. 14, '42; for biological medicaments of animal or vegetable origin, and pharmaceutical medicaments of animal, vegetable or mineral origin; since Nov. 20, 1899.

396,265. Cook Laboratories, Inc.; New York, N. Y.; Feb. 13, '42; for local anesthetics and local anesthetics with vasoconstrictors; since Aug. 31, '33.

408,512. Sharp & Dohme, Incorporated; Philadelphia, Pa.; July 14, '38; for pharmaceutical preparation useful as tonics; since June 10, '38.

416,224. Eastman Kodak Co.; Rochester, N. Y.; Feb. 17, '39; for cellulose acetate; since Dec. 22, '37.

441,299. American Waterproofing Corp.; Brooklyn, N. Y.; Mar. 7, '41; for waterproofing and dampproofing materials; since May 16, '29.

442,360. Kearny Manufacturing Company, Inc.; Kearny, N. J.; Apr. 7, '41; for conditioning liquids in the form of chemical preparations for the treatment of textile fibres; since Sept. 10, '40.

449,948. Samuel L. Abbot, (S. L. Abbot Co.); San Francisco, Calif.; Jan. 2, '42; for sodium arsenate; since Nov. 24, '41.

450,144. Pioneer Salt Co.; Philadelphia, Pa.; Jan. 10, '42; for powder cleanser or detergent; since July 31, '41.

450,244. Albert P. Pepper; New York, N. Y.; Jan. 15, '42; for chemical products for keeping hosiery and lingerie in good condition; since Oct. 20, '41.

450,309. Harry B. Jackson, doing business as The E-Z Speedy Co.; Cincinnati, Ohio; for chemicals, medicines, and pharmaceutical preparations for relief of headaches and constipation; since Aug. 20, '41.

450,378. Puritan Chemical Co.; Atlanta, Ga.; Jan. 21, '42; for device containing chemicals for use in absorbing moisture and as a deodorizer; since Dec. '41.

450,439. American Tar Company; Seattle and Spokane, Wash.; Jan. 24, '42; for coal tar and asphalt products; since Mar. 1, '22.

450,611. Basic Refractories, Inc.; Cleveland, O.; Jan. 31, '42; for refractory furnace lining preparations; brick and other shapes; since May 12, '39.

450,732. Deutsche Gold- Und Silber-Scheideanstalt Vormals Roessler; Frankfort-on-Main, Germany; Feb. 4, '42; for chemical products for industry purposes—namely, hardening and soldering compounds; since Sept. 23, 1926.

451,044. The Borden Company; New York, N. Y.; Feb. 18, '42; for aqueous solutions of casein with added chemical ingredients to which pigments are added to form water inks of desired colors; since May 14, '37.

451,139. Minnie Greenstein, (A.S.G. Pipe Lining Co.); New York, N. Y.; Feb. 21, '42; for lining cement for pipes and fittings; since Feb. 5, '42.

451,252. X-Pando Corp.; Long Island City, N. Y.; Feb. 26, '42; for transparent liquid coating materials for water proofing and damp-proofing; since August, '33.

441,869. Hill-Luthy Co.; Peoria, Ill.; Mar. 24, '41; for water softener chemicals; since Feb. 26, '41.

451,440. The B. F. Goodrich Company; New York, N. Y. and Akron, Ohio; Mar. 6, '42; for chemically treated polishing gauze and cloths, spot remover, glass cleanser, automobile top dressing, white sidewall tire cleaner, and belt dressing; since July, '41.

451,511. Boris Th. Sokoloff; Bloomfield, N. J.; Mar. 9, '42; for vitamin preparations; since Jan. 7, '42.

451,584. Union Potash & Chemical Co.; Chicago, Ill.; Mar. 12, '42; for potash used primarily for fertilizer purposes; since Jan. 16, '42.

451,681. Kelite Products, Inc.; Los Angeles, Calif.; Mar. 17, '42; for cleaning powders, cleaning paste, cleaning fluids and soaps; since Feb. 10, '37.

451,695. The Davidson Chemical Corp.; Baltimore, Md.; Mar. 28, '42; for contacting agent for treatment of gases, liquids or solids and employed particularly as a desiccant or dehumidifier; since Aug. 2, '39.

451,743. The Excelsior Varnish Works, Inc.; Cleveland, Ohio; Mar. 19, '42; for solvent, detergent preparation; since Jan. 15, '42.

451,768. General Chemical Company; New York, N. Y. Mar. 20, '42; for paste cleanser suitable for cleaning painted surfaces; since Feb. 12, '42.

451,842. Innis, Speiden & Co.; New York and Niagara Falls, N. Y.; Mar. 23, '42; for ferric chloride; since Mar. 16, '42.

451,853. Parke, Davis & Company; Detroit, Mich; Mar. 23, '42; for a preparation containing the vitamin B complex and vitamin C; Dec. 6, 1935.

451,854. Parke, Davis & Company; Detroit, Mich.; Mar. 23, '42; for multiple vitamin preparation; since Sept. 23, '31.

451,855. Parke, Davis & Company; Detroit, Mich.; Mar. 23, '42; for a preparation containing an iron salt and desiccated fresh whole bile; since Feb. 12, '40.

451,856. Parke, Davis & Company; Detroit, Mich.; Mar. 23, '42; for a preparation containing an oral bacterial vaccine used in prevention of upper respiratory infections; since Sept. 20, '34.

451,896. International Telephone and Radio Mfg. Corp.; New York, N. Y.; Mar. 25, '42; for monomeric styrene; since Mar. 11, '42.

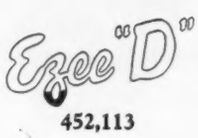
451,915. Medical Research Labs., Inc.; Cleveland, O.; Mar. 26, '42; for medicinal and dental products in which the principal ingredients are iodine, tannic acid, phenol and glycerine; since May 1, '41.

451,972. Foundry Services, Inc.; New York, N. Y.; Mar. 28, '42; for chemical compounds, compositions and preparations for use in foundry and casting work; since May 1, '34.

† Trademarks reproduced and described include those appearing in the *Official Gazette of the U. S. Patent Office*, June 2 to June 30.

New Trade Marks of the Month

BECLYSYL
451,993



452,113

GRA-MO-MOR
452,317

Vischolinal
452,483

Kodagraph
452,714

NACO-KOP
452,022

BENDIXIZED
452,344

EVRAMIN
452,490

PETROPON
452,754

PHOSPHALJEL
452,118

MASTOL
452,372

ULTRANATE
452,491

MONOMESTROL
452,757

NACO-SUL
452,023

452,149

Utan
452,373

FLEXOLITE
452,511

APPLELOK
452,770

HARMONY
452,094

CYCLONE
452,374

COLUMA
452,538

NEOZYME
452,791

VASOSULFA
452,178

PECTAMINE
452,792

452,102

RIBRANEX
452,229

HI-PLEX
452,384

SOLVAMIN
452,603

MULTI-LEX
452,830

GUARDEX
452,292

GERMSTROYD
452,393

RAYOCORD
452,622

POLY-LEX
452,831

KLOR
452,106

ADSCAPS
452,235

CATAPLEX A
452,450

Kodachrome
452,711

V-ALL
452,837

Trade Mark Descriptions (*Cont'd.*)

451,993. Abbott Laboratories; North Chicago, Ill.; Mar. 30, '42; for medicinal preparation; since Mar. 24, '42.

451,996. American Tar Company; Seattle, Wash., and Spokane, Wash.; Mar. 30, '42; for crude coal tar, pitch and asphalt; since Mar. 1, '22.

452,022. Naco Fertilizer Co.; New York, N. Y.; Mar. 30, '42; for insecticide dust; since Oct. 8, '41.

452,023. Naco Fertilizer Co.; New York, N. Y.; Mar. 30, '42; for insecticide dust; since Oct. 8, '41.

452,094. The A. S. Boyle Company; Jersey City, N. J.; Apr. 2, '42; for vitamin preparations; since Feb. 10, '42.

452,102. Philip A. Hunt Company; Brooklyn, N. Y.; Apr. 2, '42; for chemicals for developing photographic papers; since Jan. 2, '42.

452,106. Natural Products Corporation; Los Angeles, Calif.; Apr. 2, '42; for vitamin-mineral food supplement tablet; since Jan. 15, '42.

452,113. Ultra-Life Laboratories, Inc.; East Saint Louis, Ill.; for animal sterol in edible powdered form for use in poultry and animal feeds; since May 1, '42.

452,118. John Wyeth & Brothers, Inc.; Philadelphia, Pa.; Apr. 2, '42; for medicinal compound for treatment of the gastro-intestinal tract; since Mar. 17, '42.

452,149. Instant Chemical Corp.; New York, N. Y.; April 4, '42; for chemical preparation for extinguishing fires; since Mar. 18, '42.

452,178. Frederick M. Turnbull; Los Angeles, Calif.; Apr. 6, '42; for sulfathiazole compound; since Mar. 31, '42.

452,229. S. M. A. Corp.; Chicago, Ill.; Apr. 8, '42; for vitamin preparations; since Mar. 20, '42.

452,235. American Druggists Syndicate, Inc; Long Island City, N. Y.; Apr. 8, '42; for vitamin compound; since Apr. 1, '42.

452,292. Elbert H. Pratt, doing business as Arzone Prods Co.; Chicago, Ill.; Apr. 11, '42; for mothproofing preparations; since Mar. 15, '41.

452,317 Scott Products Company, (United Vitamin Co.); Chicago, Ill.; Apr. 13, '42; for concentrated vitamin product; since Mar. 31, '42.

452,344. Jacob Bendix; New York, N. Y.; Apr. 15, '42; for compounds used in the treatment of textiles; since Feb. '41.

452,372. Armour and Co.; Chicago, Ill.; Apr. 16, '42; for veterinary medicines useful as antiseptics especially for treating udder infections; since Mar. 5, '42.

452,373. Armour & Company; Chicago, Ill.; Apr. 16, '42; for veterinary medicines useful as antiseptics and suitable for administration in the uterin tract; since Mar. 5, '42.

452,374. B. B. Chemical Co.; Boston, Mass.; Apr. 16, '42; for leather bleach; since Dec. 1902.

452,384. American Dietaids Co, Inc.; Yonkers, N. Y.; Apr. 17, '42; for vitamin B. complex tablets; since June 30, '41.

452,393. Germstroyd Products, Ltd; London, England; Apr. 17, '42; for liquid chemicals for sanitary and disinfectant purposes; since '15.

452,450. Royal Lee, (Vitamin Products Co.); Milwaukee, Wisc; Apr. 20, '42; for concentrated vitamin preparation; since Mar. 30, '42.

452,483. Arnold Palm, M.D. (Palm Pharmacal Co.); New York, N. Y.; Apr. 21, '42; for mistletoe-phenobarbital preparation enriched with choline for hypertension and local vasospasms; since Oct. '38.

452,490. American Home Products Corp.; Jersey City, N. J.; Apr. 22, '42; for medicinal vitamin preparations; since Apr. 10, '42.

452,491. The Atlantic Refining Co.; Philadelphia, Pa.; Apr. 22, '42; for petroleum sulfonates; since Jan. 15, '40.

452,511. Royce Chemical Co.; Carlton Hill, N. J.; Apr. 22, '42; for synthetic resin suitable for warp sizing and for other textile purposes; since Apr. 16, '42.

452,538. Premo Pharmaceutical Labs., Inc.; New York, N. Y.; Apr. 23, '42; for antacid preparation containing colloidal aluminum hydroxide in tablet or liquid form; since Jan. 1, '42.

452,603. Commercial Solvents Corp.; New York, N. Y.; Apr. 27, '42; for vitamin concentrates used in pharmaceutical preparations; since Apr. 13, '40.

452,622. Rayonier, Incorporated; San Francisco, Calif.; Apr. 27, '42; for wood pulp; since Mar. 30, '42.

452,711. Eastman Kodak Co.; Jersey City, N. J.; and Rochester, N. Y.; May 1, '42; for photographic chemicals; since Oct. 23, '41.

452,714. Eastman Kodak Company; Jersey City, N. J. and Rochester, N. Y.; May 1, '42; for photographic chemicals; since Oct. 23, '41.

452,754. The Pure Oil Company; Chicago, Ill.; May 2, '42; for hydrocarbon polymers and other heavy or viscous mineral oil products; since Apr. 24, '42.

452,757. Wallace & Tiernan Products, Incorporated; Belleville, N. J.; May 2, '42; for hormone compositions; since Apr. 17, '42.

452,770. Barrett Fisher, doing business as Westville Laboratories, New Haven, Conn.; May 4, '42; for spray for apple and other fruit trees; since July 15, '41.

452,791. Frederick Stearns & Company; Detroit, Mich.; May 4, '42; for enzyme preparation for use as a pharmaceutical; since Apr. 24, '42.

452,792. Frederick Stearns & Company; Detroit, Mich.; May 4, '42; for nutritive solution for injection in patients who are not receiving proper nourishment orally, and as a transfusion; since Apr. 24, '42.

452,830. Lex Laboratories, Inc.; Flushing, N.Y.; May 6, '42; for medicinal compounds of multiple vitamin factors; since June 30, '41.

452,831. Lex Laboratories, Inc.; Flushing, N.Y.; May 6, '42; for medicinal compounds of multiple vitamin factors; since June 30, '41.

452,837. Queens Vitamin Products, Inc.; Flushing, N. Y.; May 6, '42; for medicinal compounds of multiple vitamin factors; since June 30, '41.

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CHEMICAL INDUSTRIES

Statistical and Technical Data Section

No. 1 Part 2

War Regulations
Priorities, Allocations, Import and Price Controls—p. 29

Summary of War Regulations

There are no more important subjects to the chemical industry today than priorities, allocations, import and price controls. Chemical Industries, last month, chronologically digested the important regulations up to May 31, 1942. This month new regulations are brought up to June 30, 1942. Next month and each month thereafter additional and revised regulations will be given.

By way of explanation a "P" order identifies a limited blanket rating given to a company, or an industry to facilitate the acquisition of scarce materials needed by such companies for defense or essential civilian production.

Distribution of commodities under industry-wide control generally is governed by "M" (material) orders, regulating distribution and flow of a given material into defense or essential civilian production channels.

Limits on the production of materials are covered by "L" limitation orders.

Agar

June 13, 1942. To prevent diversion of agar to non-defense purposes, the definition of the material in Conservation Order M-96 has been changed to include wet as well as dry forms. Amendment No. 1 accomplishes this by defining agar to mean "any mucilaginous substance, whether dried or in other form.

Benzene

June 1, 1942. Benzene placed under complete allocation control by issuance of amendment to General Conservation Order M-137.

Beryllium

June 1, 1942. Order M-160 places beryllium, alloying metal used to harden copper, under complete allocation control.

Butadiene

June 27, 1942. Butadiene, basic ingredient for manufacture of Buna-type synthetic rubber, was placed under allocation from producers by Director of Industry operations with issuance of Order M-178, effective July 1.

Cellophane

June 8, 1942. Use of cellophane further restricted by amendment to Limitation Order L-20.

Chlorates

June 1, 1942. Chlorate chemicals put under complete allocation control by General Preference Order M-171.

June 1, 1942. Coatings containing organic binders or pigments may not be used for coating steel containers of two gallons or greater capacity after June 20, by General Conservation Order M-158.

Cobalt-Nickel Oxide

June 9, 1942. Amendment No. 1 to Conservation Order M-39-b limits consumption of cobalt in manufacture of ground coat frit, an important ingredient in enamelling of steel, limits, in any quarter, to 35% of amount of cobalt used in first six months of 1941. Amendment permits use of cobalt-nickel oxide which cannot be practicably separated into cobalt and nickel, and at same time prohibits use of cobalt or compounds which can be so separated.

Dyes

June 26, 1942. Amendment to Conservation Order M-103 provides civilian quotas for anthraquinone vat dyes and other anthraquinone dyes for July 1 to September 30 at rate of 70% of their use in 1941. Current quarter's quota is at rate of 50% of last year's use.

Film Scrap

June 29, 1942. Price Regulation No. 171, effective June 30, sets maximum prices for unwashed or washed film scrap when sold in quantities equalling or exceeding 50 lbs., and for dissolved scrap when sold in quantities equalling or exceeding 5 gallons.

Laboratory Equipment

June 12, 1942. Limitation order L-144 prohibits sale and delivery of laboratory equipment except for certified essential uses in order to save highly critical material and to make certain that such equipment will be available for vital war purposes.

Magnesite

June 20, 1942. To insure adequate supply of maintenance grade deab-burned grain magnesite for Vanadium Corporation of America and Mathieson Alkali Works, Inc., OPA has granted permission to Westvaco Chlorine Products Corp. to increase selling price to $40.50 per ton in sales to these two consumers.

Platinum

June 2, 1942. All traffic in platinum except that conducted through normal, approved trade channels was halted by General Conservation Order M-162. Where transfer of platinum is permitted, the transaction, as well as inventories, must be filed with WPB on forms designated by WPB.

Resins

June 5, 1942. Amendment to General Conservation Order M-56 removes restrictions on use of natural resins in manufacture of playing cards, pencils, house paint, label varnishes, toys and farm equipment.

Rotenone

June 5, 1942. Amendment to Conservation Order M-133 permits use of rotenone as an insecticide in treatment of cattle grubs, but may not be used as germicide for citrus fruits.

Rubber

June 13, 1942. Amendment (No. 7) to Supplementary Regulation No. 1 to General Maximum Price Regulation, and an amendment (No. 18) to Revised Price Schedule 88, covering petroleum and petroleum products, removes price ceilings on synthetic rubber, aviation gasoline, toluene, and materials essential to their manufacture.

Tin

June 6, 1942. Amended version of Conservation Order M-43-a, effective July 1, cuts use of tin in non-critical products 10%.

June 27, 1942. Revision of Conservation Order M-81 prohibits use or manufacture of tinplate or terneplate cans for many chemicals, paints and other products.

Toluene

June 13, 1942. Amendment (No. 7) to Supplementary Regulation No. 1 to General Maximum Price Regulation, and an amendment (No. 18) to Revised Price Schedule 88, covering petroleum and petroleum products, removes price ceilings on synthetic rubber, aviation gasoline, toluene, and materials essential to their manufacture.

War Regulations
Priorities, Allocations, Import and Price Controls—p. 29

War Regulations

War Production Board Chemical Personnel—p. 30

WAR PRODUCTION BOARD
MATERIALS DIVISION

THE CHEMICALS BRANCH

Office of the Chief
Branch Chief.....E. W. Reid
Deputy Branch Chief.....D. P. Morgan
Executive Officer.....C. Osborn
Administrative Officer.....A. Dudley

Special Assistants
Senior Consultant.....E. R. Weidlein
Patent Officer.....A. E. Elder
Consultant.....C. C. Monrad
Consultant.....P. H. Cabot

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L. Brown

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Section Chief.....
Analysis Unit.....
Allocation Unit.....
Appeals Unit.....H.M.Clements
Foreign Reqs. Unit.....
Maintenance & Repair Unit...D.L.Watson

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Section Chief.....
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Plant Facs. Unit.....

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Priority Specialists
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E. Gyebers

Industry Operations Representative

Civilian Supply Representative
P. Talbot

Assistant Branch Chief
H. S. Colth

Industrial Oils Section
Section Chief.....T.L.Daniels
Glycerin, Soap & Fatty Acids Unit.....G.A.Wrisley
Drying Oils Unit.....T.A.Barber
Marine Oils Unit.....(acting).. J.F.Coburn
Edible Oils Unit.....T.O.Asbury

Plastics & Resins Section
Section Chief.....A.E.Petersen
Plastics Unit.....R.H.Ball
Plasticizers & Glycols Unit.....R.G.Ruark
Synthetic Resins Unit.....Clinton Rector

Protective Coatings Section
Section Chief.....J. B. Davis
Paint, Varnish & Lacquer Unit.....E. H. Bucy
Pigments & Colors Unit.....B. M. Van Cleve
Associated Products Unit.....

Synthetic Rubber Section
Section Chief.....P.H.Carman
Synthetic & Chlorinated Rubber Unit.....B.Ross
Rubber Chem. & Rubberlike Plastics Unit.....R.P.Kenney
Plant Reqs. & Process Unit.....G.L.Roberts

Assistant Branch Chief
W. G. Whitman

Alcohol & Solvents Section
Section Chief.....P.Moffat
Industrial Alcohol Unit.....
Grain Distilled Spirits Unit....(acting) A.P.Pendergon
Solvents Unit.....W.Mueller
Molasses Unit.....J.T.Menard

Aromatics & Intermediates Section
Section Chief.....J.Reynolds
Coal Tar Products Unit.....E.Casey
Intermediates Unit.....
Cellulose Unit.....E.L.Pearson

Inorganics Section
Section Chief.....J.W.Wiseman
Chlorine-Alkali Unit.....J.C.Leppart
Nitrogen Unit.....H.H.Meyers
Agricultural Chemicals Unit.....T.E.Millman
Acids, Salts & Gases Unit.....(acting)J.Boyer

U. S. Chemical Patents

Off. Gaz.—Vol. 536, No. 5—Vol. 537. Nos. 1, 2, 3—p. 348

A Complete Check—List of Products, Chemicals, Process Industries

Agricultural Chemicals

Fertilizer and process for making the same. No. 2,280,451. Griffith H. Riddle to Research Foundation, Inc.

Composition prepared for use for regulating the growth of plants, said composition containing as an essential ingredient alpha naphthylthioacetamide. No. 2,280,756. Albert Saukaitis to American Chemical Paint Co.

Cellulose

Process of stabilizing cellulose yarns against deterioration by heat which comprises impregnating said yarns with biuret to an extent sufficient to stabilize said yarns against deterioration by heat. No. 2,278,284. John S. Reese to E. I. du Pont de Nemours & Co.

Process of stabilizing unmodified regenerated cellulose yarns against deterioration by heat which comprises impregnating said yarns with urea to extent of at least 3% by weight of said yarns. No. 2,278,285. John S. Reese to E. I. du Pont de Nemours & Co.

Cellulose ether products. No. 2,278,389. Deane C. Ellsworth to E. I. du Pont de Nemours & Co.

Process treating cellulosic material to impart there-to water-repellent properties. Nos. 2,278,417-418. Alfred Baldwin, John Gwynant Evans, and Charles Salkeid to Imperial Chemical Industries, Ltd.

Cellulosic structure and method for making same. No. 2,279,339. Franklin Peters to E. I. du Pont de Nemours & Co.

Mold inhibitive cellulosic structure. No. 2,279,788. Walter Jebens to E. I. du Pont de Nemours & Co.

Process making a catalyst which comprises co-precipitating gel type oxides of chromium and aluminum in the ratio of 8.5-49 mol per cent of chromium oxide to 42.5-88.2 mol per cent aluminum oxide and intimately associating therewith 2-15 mol per cent of copper oxide. No. 2,280,060. Robert Burke and Everett Hughes to The Standard Oil Co.

Ceramics, Refractories

Fired ceramic product comprising particles of calcined gypsum bonded by a glass-like binder. No. 2,278,455. Harry Linzell and Joseph Gill to United States Gypsum Co.

Cellular Refractory. No. 2,278,486. Wirt Quigley and Jay Gould Coutant to Quigley Co., Inc.

Manufacture of Basic Refractories. No. 2,278,454. Harley Lee to Basic Refractories, Inc.

Process of making ceramics, abrasives, and the like from alumina, and products thereof. No. 2,278,442. John Heany to Heany Industrial Ceramic Corp.

Lead-free glaze of low maturing temperature for use in decorating ceramic ware. No. 2,278,867. Alden Deyrup to E. I. du Pont de Nemours & Co.

Refractory composition. No. 2,277,704. Charles J. Kinzie and Eugene Wainer to The Titanium Alloy Mfg. Co.

Refractory composition and method of making same. No. 2,277,705. Charles J. Kinzie and Eugene Wainer to The Titanium Alloy Mfg. Co.

Refractory composition. No. 2,277,735. Eugene Wainer and Harold D. Prior to The Titanium Alloy Mfg. Co.

Process of imparting an inside frost to glass bulb which comprises subjecting the bulb to a solution comprising substantially 23% hydrofluoric acid, 20% ammonium bifluoride, 4% sodium bicarbonate, 33% denatured alcohol, 10% soda and 10% water. No. 2,278,257. Daniel P. Gallagher.

Glass colors of high alkali. No. 2,278,868. Alden Deyrup to E. I. du Pont de Nemours & Co.

Cast refractory article consisting principally of trigonal crystals of a solid solution of alumina and chromic oxide. No. 2,279,260. Raymond Benner, Henry Baumann Jr. and George Easter to The Carborundum Co.

Vitreous enamel coated steel article and method of making the same. No. 2,279,935. Harvey Belding and John Eckel.

Chemical Specialty

Insecticidal composition containing as a essential active ingredient a water insoluble sulfurized N, N-diaryl-arylenediamine characterized in that at least one of the aryl groups is linked to the arylene group in a 1, 4,-thiazine ring structure. No. 2,277,680. Euclid W. Bousquet to E. I. du Pont de Nemours & Co.

Soap product having improved hard water characteristics. Nos. 2,277,728, 2,277,729 and 2,277,730. Richard Thomas and Henry B. Oakley to Lever Bros. Co.

Weed control composition containing as essential active ingredient a sulfamate. No. 2,277,744. Martin E. Cupery and Arthur P. Tanberg to E. I. du Pont de Nemours & Co.

Nonefflorescing bar soap. No. 2,278,352. Robert F. Heald to Colgate-Palmolive Peet Co.

Resin-like casein glue. No. 2,279,096. Trygve Sparre to The Borden Co.

Adhesive composition. No. 2,279,256. Jacob Mark to Dewey and Almy Chem. Co.

A non-soap detergent composition of matter comprising a non-soap detergent active ingredient selected from the group consisting of higher fatty sulfonated amides and higher fatty isethionates, tetrasodium pyrophosphate to impart a slippery feel to a solution containing said composition in a cencentration ordinarily used in detergent operation, and an acid salt to impart to said solution of the composition a pH value of not over 7. No. 2,279,314. Lloyd Henderson and Bernard Maxwell to Lever Brothers Co.

Fabric cleaning composition. No. 2,279,532. Harry Seran.

An exothermic composition for use in imparting a permanent wave to a preformed tress of hair upon the addition thereto of moisture comprising a stable mixture of a comminuted amphoteric metal, from the group between the alkaline earth metals and hydrogen in the electromotive force series of metals, a nitrate, an alkaline earth metal hydrate, a salt which will produce a basic ion in solution, and a filler material. No. 2,279,589. Samuel Grant to Products Development, Inc.

Process for producing copying paper comprising coating one side of said paper with an aqueous dispersion of latex and then coating the other side of said paper with an aqueous dispersion of latex and a coloring substance free from a precipitating action upon said latex. No. 2,279,604. Rudolf Walti.

Insecticide preparation containing an insecticide derived from a member of the class consisting of derris root, derris powder, timbo root, cube root, pyrethum flowers, and as a stabilizer therefor, a condensation product of an aliphatic ketone with a secondary aromatic amine. No. 2,279,800. William ter Horst to United States Rubber Co.

Process of making leavened bread, which comprises incorporating cystine with the ingredients of the dough batch, and fermenting the batch. No. 2,280,031. Frederick Weber to Keratene Co.

Preparation of egg products. No. 2,280,147. Norman Fischer to Armour and Co.

Laxative containing germinated and roasted linseeds as laxative ingredient. No. 2,280,265. Albert Regensburger.

Vermicidal composition comprising copper sulfate, sodium arsenite, and sodium chloride. No. 2,280,340. Luther Miller and Thomas Booth.

Protective treatment for wood. No. 2,280,560. Henri Vautherin. One-half to Pierre Schelameur and one-half to Yves Elie Marie Jacques de Liniers.

Coal Tar Chemicals

Asphalt and process for producing same. No. 2,277,842. Ulrie B. Bray to Union Oil Company of California.

Preparation of diamidine derivatives. No. 2,277,861 and 2,277,862. Arthur J. Ewins, Harry J. Barber, George Newbery, Julius N. Ashley, and Alan D. H. Self to May & Baker, Ltd.

Preparation of methyl ester of diacetylthreuronic acid. No. 2,277,872. Richard Pasternack and Ray A. Patelski to Charles Pfizer & Co.

A 4-methallyloxy diarylamine. No. 2,278,559. Philip Paul to the United States Rubber Co.

Process preparing stable unsaturated aliphatic acids and derivatives. No. 2,279,734. Emil Dreger, John Ross, and Hans Dirschenbauer to Colgate Palmolive-Peet Co.

Method for recovering pyridine. No. 2,279,585. Max Wald and Frank Karnatz to Republic Steel Corp.

In process of preparing aliphatic cyclic hydrocarbons containing three cyclic carbon atoms the step which comprises causing a mixture consisting of zinc and of a compound of the general formula CH2X1-CH2-CHX2-R wherein X1 and X2 stand for a halogen selected from the group consisting of chlorine and bromine, and R stands for a substituent selected from the group consisting of hydrogen and methyl, to react in the presence of formamide. No. 2,279,721. Walter Schmidt, Franz Pohl and Otto Nicodemus to Winthrop Chemical Co., Inc.

Product comprising solid 3-amino-4-hydroxy phenylarsine oxide, said product being a substantially white amorphous soil, completely soluble in alcohol and containing approximately 37.7% arsenic. No. 2,280,132. Albert Scott and James Sultzaberger to Parke-Davis & Co.

Process for manufacture of compounds of the cyclopentano-polyhydrophenanthrene series, wherein steroids containing an ethinyl group are subjected to the action of an agent capable of adding on water to the ethinyl group. No. 2,280,236. Hans Inhoffen and Willy Logemann and Hans Dannenbaum to Schering Corp.

Method for preparing αα'B-trihalogen-substituted butyraldehyde. No. 2,280,290. LeRoy High to The Udylite Corp.

Cyclic sulfonic acid amide compounds. No. 2,280,497. Fritz Mietzsch and Josef Klarer to Winthrop Chemical Co., Inc.

Process producing compounds of diaryl series which process consists in transforming the diazo-compound of an amine selected from the group consisting of amines of the aromatic series and amines of the carbazole series into a scarcely water soluble diazoamino-compound and while splitting off the diazoamino-compound by the action of an acid agent condensing with an aromatic compound in the molecule of which only members of the group consisting of hydrogen, halogen, nitro-, aldehydr-, detone- and carboxylic acid groups are attached to the ring members. No. 2,280,504. Werner Zerweck and Karl Schutz to General Aniline & Film Corp

Sulfonic acid of a phthalocyanine containing a phenyl group as a substituent on each of its four benzene nuclei this product having been obtained by sulfonating a phthalocyanine containing a phenyl group as a substituent on each of its 4 benzene nuclei. No. 2,280,507. Berthold Bienert and Subastian Gassner to General Aniline & Film Corp.

Coatings

Preparation of mineral-coating composition. No. 2,277,952. Frederick H. Frost and Killey E. Terry to S. D. Warren Co.

Method applying polyvinyl chloride to metal surfaces. No. 2,278,345. Donald G. Benson to The B. F. Goodrich Co.

Adhesive coated sheet material. No. 2,278,673. Martin Savada and William Horowitz.

Method of treating the surface of materials for forming thereon, through a wet method and in the absence of an external electric source, a highly adhesive deposit of a metal. No. 2,278,722. Jean Loiseleur to Societe Anonyme des Manufactures des Glaces & Produits Chemiques de Saint Gobain, Chauny & Cirey.

Method applying a protective coating to ferrous metal which comprises applying to the minum, a zinc soap and a solvent for said soap, and heating the coated metal at a temperature sufficiently high to melt the soap and diffuse the coating into the ferrous metal. No. 2,279,268. Lester Adams to General Electric Co.

Surface coating composition adapted to give a porcelain-like, nonporous and tack-free surface containing at least 50% of a soft drying oil selected from the group consisting of linseed, perilla, soya bean and sunflower oils in the non-volatile portion thereof, and a soap selected from the alkali earth metals, magnesium and manganese soaps of oleic and linoleic acids, in an amount more than 1% based on the amount of the soft oil but insufficient to produce deep longitudinal folds in the dried coating. No. 2,279,754. William Krumbhaar.

Insulating material for use as a dielectric of a condenser comprising a binding agent primarily consisting of polymerised styrene and an

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admixture of powdered particles of lead chloride, embedded in said binding agent in an amount not exceeding 25% by volume and not sufficient to raise the power factor of the resulting material above .0025, but sufficient to raise the permittivity of the resulting material by at least 10%. No. 2,279,762. Thomas Scott and Archibald New to Internation Standard Electric Corp.

In manufacture of coated wire, the process which comprises depositing on the wire a deposit of finely divided crystalline synthetic linear polymeric amide by passing the wire through a water suspension of said polymeric amide, fusing the deposit of polymeric amide and quenching the fused coating. No. 2,279,771. Paul Austin to E. I. du Pont de Nemours & Co.

Process obtaining products having an adherent coating of vitreous-like tough enamel resistant to chipping and mechanical shock. No. 2,279,774. Elmer Bolton to E. I. du Pont de Nemours & Co.

Method preparing urea nitrate, which comprises reacting urea with nitric acid in a liquid medium taken from the group consisting of acetic acid and propionic acid. No. 2,279,765. Charles Spaeth to E. I. du Pont de Nemours & Co.

Process for the production high indene-content hydrocarbon oils. Nos. 2,279,778,-779,-780. Karl Engel to Allied Chemical & Dye Corp. Neckargemuend, and Karl Wilke to General Aniline & Film Corp.

Conductive coating for glass and method of application. No. 2,280,-135. Theodore Ward.

Dyes, Stains

Dioxazine dyestuffs. No. 2,278,260. Heinrich Greune and Gerhard Langbein to General Aniline & Film Corp.

Photographic sensitizing dyes and compositions containing the same. No. 2,278,461. Edmund Middleton to Du Pont Film Mfg. Corp.

Azo Dyes. No. 2,278,491. Swanie Rossander and Chiles Sparks to E. I. du Pont de Nemours & Co.

Pentakisazo Dye. No. 2,278,492. Swanie Rossander and Chiles Sparks to E. I. du Pont de Nemours & Co.

Triarylmethane dyestuffs and process of preparing them. No. 2,278,-961. Paul Wolff, deceased, Richard Wenzel and Karl Frank to General Aniline & Film Corp.

Vat dye preparations. No. 2,278,973. Clifford Carr to E. I. du Pont de Nemours & Co.

Dyestuffs of the anthraquinone series. No. 2,278,977. William Dettwyler to E. I. du Pont de Nemours & Co.

Readily water-soluble dry detergent composition. No. 2,279,248. William Pratt, Annette Pratt.

Color process using cellulose ester emulsions. No. 2,279,406. John Leermakers and Scheuring Fierke to Eastman Kodak Co.

Vat dyestuff of the dibenzanthrone series and process of making same. No. 2,279,725. Hugo Wolff, Mannheim, Emil Krauch,

Dyestuff of the methine series. Dyeing acetate artificial silk deep violet shaded of very good fastness properties. No. 2,280,253. Werner Muller and Carl Berres to General Aniline & Film Corp.

Equipment, Apparatus

Combustion and chemical recovery furnace and method of operating same. No. 2,277,946. John P. Badenhausen to Day & Zimmermann, Inc.

In process producing pastes for electrodes of lead acid storage batteries which comprises treating a mixture containing at least one substance selected from group consisting of lead oxides and lead powder, with water, the step of adding to said mixture a small amount of pyrogallol, keeping the paste plastic and soft. No. 2,277,973. Anna P. Hauel.

Apparatus for producing acetylene and lime hydrate. No. 2,278,521. Hugo V. Kojola and Maurice O'Brian to The Prest-O-Lite Co., Inc.

Continuous solvent extraction apparatus. No. 2,278,647. James Cyphers and George Scheu and Wallace T. Jones to Rockwood & Co.

Apparatus for treatment of gases with sulphuric acid. No. 2,278,778. Samuel Grossmann and Donald Rogers to The Solvay Process Co.

Apparatus for preparation of cast resins. No. 2,278,858. Reuben Fields to E. I. du Pont de Nemours & Co.

Apparatus for effecting chemical transformation of a fluid substance by contact with a solid catalyst in divided form. No. 2,278,892. Richard E. Nalge and Leon Gaucher to The Texas Co.

Acetylene generator. No. 2,278,955. Eber Van Valkenburg to Century Engineering Co.

Method and apparatus for determining the carbon pressure of gases. No. 2,279,231. John Gier, Jr. to Westinghouse Electric & Manufacturing Co.

Apparatus for treating articles coated with concentrated aqueous solutions of gold cyanide. No. 2,279,580. Robert Miner to Western Electric Co., Inc.

Apparatus for heating liquids. No. 2,280,028. Sherman Chase and Harold Holmboe.

Catalytic Converter. No. 2,280,081. Thomas Prickett and Ernest Utterback to Houdry Process Corp.

Method of measuring gas in gas-containing liquids which comprises, subjecting a gas-containing liquid to two different pressures, at least one of which is sub-atmospheric, measuring the electrical specific resistivities of said liquid at said pressures, and determining the gas content of said liquid from the difference in said specific resistivities. No. 2,280,086. John T. Hayward.

Catalytic converter and heat exchange unit therefor. No. 2,280,089. Eugene Houdry to Houdry Process Corp.

Distillation method and apparatus. No. 2,280,093. Robert Kleinschmidt to Arthur D. Little, Inc.

Salt dissolving apparatus for producing a highly saturated brine solution. No. 2,280,466. Arthur Friezland Black to Myles Salt Co.

Explosives

Priming mixture including a zoisitic aplite rock. No. 2,278,530. Willi Brun to Remington Arms Co., Inc.

Method producing an explosive mixture comprising, first, intimately mixing NH_4NO_3 and combustibles consisting of particles approaching colloidal dimensions and capable at low density of detonation by a No. 6 or 8 cap; secondly, compressing said NH_4NO_3 and combustibles into a non-explosive (to a No. 6 or 8 cap) mass, and, thirdly, crushing said non-explosive mass into a mixture detonatable by a No. .. or 8 cap. No. 2,280,366. Jacob Barab.

Fine Chemicals

Fermentation process for production of 2-ketogluconic acid. No. 2,277,716. Lewis B. Lockwood, George E. Ward, Joseph J. Stubbs, Edward T. Roe and Benjamin Tabenkin to Henry A. Wallace.

Manufacture of 3-aryl-aminotetrahydrofuranes. No. 2,278,202. Hans Lange to General Aniline & Film Corp.

An expanded, structure disrupted, medicinal, low starch bulk producing and mucilaginous exuding seed. No. 2,278,464. Albert Musher to Food Manufacturing Corp.

Aminal protein material. No. 2,278,476. Albert Musher to Food Manufacturing Corp.

Manufacture hydrogen peroxide. No. 2,278,605. Gustav Adolph and Max Bretschger to Buffalo Electro-Chemical Co., Inc.

Method of making cellulose glycollic acid. No. 2,278,612. William Collings, Richard Freeman, and Robert Anthonisen to The Dow Chemical Co.

Process preparing protein concentrate from soya beans. No. 2,278,670. Philip Rauer.

Metal derivatives of amino methylene aldehydes. No. 2,278,965. Adrianus van Peski, Nicolas Max and Johannes van Melsen to Shell Development Co.

Mono-sodium salt of Bz-2:Bz-2'-dihydroxydibenzanthrone. No. 2,278,-987. Donald Graham to E. I. du Pont de Nemours & Co.

2-methoxy-5-animobenzyl alcohol. No. 2,278,996. David Klein to E. I. du Pont de Nemours & Co.

Process removing colored impurities from a N,N'-dialkyl-p-phenylenediamine obtained from a condensation product. No. 2,279,385. Marshall Brimer to Eastman Kodak Co.

Light sensitive photographic film which comprises a cellulose ester support, an emulsion layer, and a backing layer of a synthetic resin. No. 2,279,410. Gale Nadeau and Norwood Simmons and William O. Kenyon to Eastman Kodak Co.

A coccidiosis control composition for internal application to prevent development of coccidiosis in animals susceptible to the disease which contains as its essential active ingredient tetraethylthiuram monosulfide. No. 2,279,421. Wendell Tisdale to E. I. du Pont de Nemours & Co.

An anti-sunburn preparation comprising a mixture of an alkyl ester of 3-methoxy-courmaric acid and an oil-soluble, liquid ester of salicyclic acid in a common oily excipient, the concentration of the coumaric acid ester in said preparation being greater than would be obtainable by dissolving the same ester in the same excipient in the absence of said liquid ester of salicyclic acid. No. 2,279,468. Joseph Lahousse and Anne Casati, Jean Gonnard to Societe des Usines Chimiques Rhone-Poulene.

A detoxicant for mineral poisons consisting of finely powdered true carob seed. No. 2,279,879. Margaret Crosse.

Acetamidine anthranilate and preparing which comprises reacting an acetamidine salt with anthranilic acid in the presence of an alkali. No. 2,279,514. Garnet Ham and Robert Barnes to American Cyanamid Co.

Method of preserving fresh fish viscera containing vitamin-bearing oil which consists in increasing the hydroxly ion concentration to a pH in excess of 9.0. No. 2,280,024. Robert Bedford to The Atlantic Coast Fisheries Co.

Process of preparing nicotinic acid amide. No. 2,280,040. Howard Seibert and Lester Szabo and Elmer Eckhardt to S. M. A. Corp.

Process for manufacture of tetraamino derivatives of phthalocyanine compounds selected from the group consisting of metal-free and metallic phthalocyanines, which comprises subjecting the corresponding tetranitro phthalocyanine compounds to reduction by means of a reducing agent selected from the group consisting of stannous chloride, sodium hydrosulfite and the alkali sulfide class. No. 2,280,072. Norman Haddock, to Imperial Chemical Industries, Ltd.

In process of producing color photographic pictures by color-forming development the step which comprises immersing the color photographic element immediately after the development thereof in a stopping bath containing a buffer solution of an acidic salt of a polybasic organic acid the pH-value of a solution of said salt being higher than 3. No. 2,280,721. Andreas Schilling and Wilhelm Schneider and Gustav Wilmanns to General Aniline & Film Corp.

An unexposed silver halide gelatine emulsion containing a color former which though soluble in aqueous liquids is fast to diffusion in gelatine, said component containing at least one substituent having a chain of the general formula (—A—X—)n, wherein A is alkylene, X is a heterogroup selected for the class consisting of —O—, —NR—, and —S—, R being H, alkyl and n is more than 5. No. 2,280,722. Wilhelm Schneider and Alfred Frolich.

Industrial Chemicals

Method for separation of chemically modified rosins and their esters into components. No. 22,057. Joseph N. Borglin to Hercules Powder Company.

An electrode for a dry cell consisting of a zinc plate bearing on one side a resinous coating with particles of carbon embedded in the coating and on the opposite side of a porous ionically permeable and electronically non-conductive coating of resinous material. No. 22,065. George Young to Stoner-Mudge, Inc.

Process for preserving wood. No. 2,277,660. Ernest R. Boller to E. I. du Pont de Nemours & Co.

Dielectric material consisting of a mixture of substantial proportion of chlorinated ortho nitrodiphenyl and a substantial proportion of nitrated aryl polynuclear hydrocarbon. No. 2,277,689. Frank M. Clark to General Electric Co.

Dielectric material and method of making same. Nos. 2,277,733, 2,277,734 and 2,277,736. Eugene Wainer and Norman R. Thielke to The Titanium Alloy Mfg. Co.

Method obtaining chemical compounds by precipitation reaction. No. 2,277,778. Merle Randall.

Process producing a lead alkide which comprises reacting a lead alkali metal alloy compound with an alkyl halide in an atmosphere of a hydrogen halide and in presence of minor proportion of bromine. No. 2,277,781. George F. Ruddies.

Wetting and detergent agent. No. 2,277,805. Mark Weisberg, Louis Gorman and Preston G. Slachman to Alrose Chemical Co.

Catalytic hydrocarbon reactions and catalysts therefor. No. 2,277,819. Willis G. Craig to James W. Jean.

Hydroxyalkyloxyalkyl cyanamides. Method of preparing. No. 2,277,-821. Walter P. Ericks to American Cyanamid & Chemical Co.

Preparation of guanyl urea. No. 2,277,823. George H. Foster and David W. Jayne to American Cyanamid Co.

Magnesium chloride. Process of dehydrating. No. 2,277,827. Sheldon B. Heath and Forest R. Minger to The Dow Chemical Co.

Colloidal tertiary calcium phosphate. No. 2,277,854. Louis P. V. Lecoq.

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Process producing acrolein which comprises catalytically condensing formaldehyde and acetaldehyde in the vapor phase at temperature high enough to maintain said aldehydes in vapor phase and preventing the vapors from coming into contact with iron and aluminum. No. 2,277,887. Hermann Schultz and Hans Wagner to Chemical Marketing Co., Inc.

Stable Zein solution. No. 2,277,981. Oswald C. H. Sturken to Corn Products Refining Co.

In separation by froth flotation of copper sulfide from chalcocite ores the step which comprises subjecting an aqueous pulp of the chalcocite ore to froth flotation in presence of water-soluble primary aliphatic amine sale having from 6 to 18 carbon atoms. No. 2,278,-020. Anderson W. Ralston and Ervin W. Segebrecht to Armour & Co.

Process concentrating natural oxidized lead ores. No. 2,278,027. Joseph T. Terry

Preparation of halides. No. 2,278,053. Abraham S. Behrman.

Free flowing sodium nitrite product and method of preparation. No. 2,278,059. Francis S. Chambers and William E. Kirst to E. I. du Pont de Nemours & Co.

Ore concentrating processes of separating acidic ore materials from non-metallic ore constituents. No. 2,278,060. Ludwig J. Christmann, David W. Jayne, Jr. and Stephen E. Erickson to American Cyanamid Co.

Method of thiodiglycol production. No. 2,278,090. Donald F. Othmer and Donald Q. Kern.

Ore concentrating processes utilizing differential surface wettability principles of separating acidic siliceous gangue from non-metallic ore constituents. No. 2,278,107. David W. Jayne, Jr., Stephen E. Erickson and Harold M. Day to American Cyanamid Co.

Manufacture of catalysts. No. 2,278,223. John F. Sturgeon to Universal Oil Products Co.

Fractionation of free fatty acids. No. 2,278,309. Stephen E. Freeman to Pittsburgh Plate Glass Co.

Manufacture of amines. No. 2,278,372. John F. Olin and Edward J. Schwoegler to Sharples Chemicals, Inc.

Manufacture of amines. No. 2,278,373. John F. Olin to Sharples Chemicals, Inc.

Purification of carbon disulfide. No. 2,278,384. Johann J. Stoeckley and Elmar Profft to North American Rayon Corp.

Production of hydrocarbons from a carbonaceous material by thermal treatment at temperatures of between 300° and 600°C., in the presence of a catalyst. No. 2,278,407. Eugen Anthes, Wilhelm Fuener and Walter Simon to I. G. Farbenindustrie Aktiengesellschaft.

Interpolymers of unsymmetrical dichloroethylene. No. 2,278,415. Harold W. Arnold to E. I. du Pont de Nemours & Co.

Destructive distillation residual product of a boron derivative of a hydroxy aliphatic compound, said product being unsaturated and having drying properties. No. 2,278,425. Ivor Colbeth to The Baker Castor Oil Company.

Destructive distillation residual product of a boron derivative of an oxidized aliphatic compound, said product being unsaturated. No. 2,278,426. Ivor M. Colbeth to The Baker Castor Oil Company.

Destructive distillation residual product of a boron derivative of a polymerized hydroxy aliphatic compound, said product being unsaturated. No. 2,278,427. Ivor Colbeth to The Baker Castor Oil Company.

Roughly comminuted composition of matter comprising as major constituents a solid auxin material and a hydrophilic colloid, the latter being in solid suspension in said auxin, which composition is capable of disintegrating on contact with water to form a suspension comprising the solid auxin compound in finely-divided form. No. 2,278,443. Sheldon Heath to The Dow Chemical Co.

Amine Salts. No. 2,278,499. Frank Smith and John Hansen to The Dow Chemical Co.

Laminated Film protected surface. No. 2,278,515. Donald Gibb and Albert Savage to The Dow Chemical Co.

Halo-substitution of unsaturated organic compounds. No. 2,278,527. Frederick Rust and William Vaughan to Shell Development Co.

Process for manufacture of chemical dehydration products of lower aliphatic acids. No. 2,278,537. Henry Dreyfus and Leonard Fallows to Celanese Corporation of America.

Process for distilling a high-boiling, heat-sensitive organic liquid. No. 2,078,543. Edward H. French.

Hydrogenation of acyl-substituted compounds. No. 2,278,549. Donald Loder to E. I. du Pont de Nemours & Co.

Preparation of Alkali metal alkoxides. No. 2,278,550. Donald Loder and Donald Lee to E. I. du Pont de Nemours & Co.

Catalytic cracking of hydrocarbons. No. 2,278,590. Robert Ruthruff.

Furyl Vinyl ketone and homologues. No. 2,278,638. Carl Barnes to E. I. du Pont de Nemours & Co.

Regeneration of catalysts containing thorium. No. 2,278,644. Karl Buchner, Duisburg Hamborn to Hydrocarbon Synthesis Corp.

Method of asphalt manufacture. No. 2,278,671. Joseph Roediger to Standard Oil Development Co.

Processing of tall oil. No. 2,278,674. Ernest Segessemann to National Oil Products Co.

Preparation of polyvinyl formate. No. 2,278,783. Willy Herrmann and Wolfram Haehnel to Dr. Alexander Wacker Gesellschaft fur Electrochemische Industrie.

Purification of aliphatic acids and anhydrides. No. 2,278,831. Frank Cockerille to E. I. du Pont de Nemours & Co.

Process for solidification of a liquid fuel allowing the total regeneration of the same from the solid combustible. No. 2,278,847. Lazzaro Gregnoli and Renato Donati.

An aggregate comprising the product obtained by calcining a mixture of flint kaolin and while burning kaolin, combustible organic material, and at least one substance selected from the group consisting of oxide of calcium, magnesium, sodium, and boron. No. 2,278,957. John Walker and William Ungerleider.

Condensation of ketones. No. 2,279,020. Charles Cohen to Standard Oil Development Co.

A grainer for making salt comprising a substantially cylindrical shallow top portion, means for discharging brine into said top portion substantially tangentially thereof, and a downwardly tapering intermediate portion concentric with and depending from said top portion, the upper end of said intermediate portion being of materially less cross sectional extent that said top portion. No. 2,279,061. Clinton Robison.

Purification of sodium monoxide. No. 2,279,088. Harvey Gilbert to E. I. du Pont de Nemours & Co.

Process making alkyl amino fatty acid. No. 2,279,138. Clyde Henke and Frank Schofield to E. I. du Pont de Nemours & Co.

Process obtaining methanol. No. 2,279,153. William Wilcox, Mary Wilcox to Le Roy Snyder and James Richards and Henry Wilcox.

Method for removal of cyclohexane from admixture with benzene which comprises treating a cyclohexane-benzene-containing mixture with methyl acetate and distilling off the resultant cyclohexane-methyl-acetate-containing azetrope. No. 2,279,194. Edmund Field to E. I. du Pont de Nemours & Co.

Process ammoniating acidic fertilizer materials which comprises incorporating hexamethylene tetramine with acidic fertilizer materials in the presence of urea. No. 2,279,200. Frank Keenen to E. I. du Pont de Nemours & Co.

Removal of oxygen and the like from organic substances. No. 2,279,-277. Bernard Shoemaker to Standard Oil Co.

Polymerization products substantially identical with those obtained by polymerizing a butadiene with an acrylic acid ester of an unsaturated aliphatic alcohol at a temperature between room temperature and 80°C. No. 2,279,293. Albert Clifford to Wingfoot Corp.

Polyalkylene polyamines. No. 2,279,294. Albert Hardman to Wingfoot Corp.

Method of coating with comminuted material such as flock, which comprises providing a gaseous atmosphere which ionizes at a higher electrostatic field intensity than air, creating an electrostatic field in said atmosphere of an intensity which would create a danger of ionizing air but lower than that which ionizes the atmosphere, locating the article to be coated in said field and introducing the comminuted material into the field, adjacent the article. No. 2,279,-361. John Amstuz to Behr-Manning Corp.

In processing oleaginous material, the steps of; adding aqueous alcohol, counterflowing a chlorinated hydrocarbon relative to the oleaginous material and the aqueous alcohol for solvent-extracting oleaginous constituents, the alcohol being not more than approximately 50% by volume of the total alcohol-water content. No. 2,279,408. Dan McDonald to Erwin H. Haas.

Process of making olefin oxides by the direct chemical combination of olefins with molecular oxygen in the presence of active silver surface catalysts at temperatures between about 150° and about 400°C. No. 2,279,469. George Law and Henry Chitwood to Carbide and Carbon Chemicals Corp.

Process of making olefin oxides by the direct chemical combination of olefins with molecular oxygen in the presence of active silver surface catalysts at temperatures between about 150° and about 400°C. No. 2,279,470. George Law and Henry Chitwood to Carbide and Carbon Chemicals Corp.

In recovery of glycerol dichlorohydrin from an aqueous solution comprising the same, the steps which consist of extracting said solution with an alkylene chloride selected from the group consisting of ethylene chloride and propylene chloride, and thereafter separating the glycerol dichlorohydrin from such solvent by fractional distillation. No. 2,279,509. Edgar Britton and Harold Slagh to The Dow Chemical Co.

Composition comprising a major proportion of a viscous hydrocarbon oil having incorporated therein a small proportion of an organic hydroxamic acid compound selected from the group consisting of organic sulfonhydroxamic acids, the carboxylic acid esters and ethers of said acids and carboxylic acid esters and ethers of organic hydroxamic acids. No. 2,279,560. Melvin Dietrich to E. I. du Pont de Nemours & Co.

Chemical synthesis with electric precipitation. No. 2,279,583. Games Slayter to Slayter Electronic Corp.

Composition of matter comprising an alkyl maleic acid, the alkyl radicals of which contain at least 12 carbon atoms, and the olefinic double bonds of which are at least partially saturated with an element selected from the group consisting of halogen and sulfur, said acid having a bromine number below 15. No. 2,279,688. Robert Larsen to Shell Development Co.

Desulfurization of alkyl phenols. No. 2,279,711. Daniel Luten, Jr. and Aldo De Benedictis.

Interpolymer of de-(secondary butyl) itaconate and ethyl methacrylate. No. 2,279,881. Gaetano D'Alelio to General Electric Co.

Interpolymers of di-(methoxyethly) itaconate and ethyl methacrylate. No. 2,279,882. Gaetano D'Alelio to General Electric Co.

Interpolymers of Dehexyl itaconate and ethyl methacrylate. No. 2,279,-883. Gaetano D'Alelio to General Electric Co.

Interpolymers of dibenzyl itaconate and ethyl methacrylate. No. 2,279,884. Gaetano D'Alelio to General Electric Co.

Interpolymers of di-(isobutyl carbinol) itaconate and ethyl methacrylate. No. 2,279,885. Gaetano D'Alelio to General Electric Co.

An organic substance of the group consisting of vegetable fats and oils, animal fats and oils, vitamins, soaps, rubber, linear superpolyamides, petroleum hydrocarbons, polymerized olefins, ethers, refrigeration gases, dry-cleaning solvents, castor oil and its derivatives, methyl methacrylate resins and antioxidants, subject to oxidative deterioration accelerated by a catalytically active metal, having incorporated therein a small proportion, sufficient to inhibit the catalytic effect of the metal, of a hydroxamic acid. No. 2,279,-973. Melvin Dietrich to E. I. du Pont De Nemours & Co.

Process for manufacture of chlorides of carboxylic acids, comprising treating carboxylic acids containing at least 8 carbon atoms with phosgene at temperatures higher than 100°C. in the presence of a small amount of a salt of a tertiary amine. No. 2,279,985. Charles Graenacher and Carlo Rossi to Society of Chemical Industry.

Method of conditioning barite as a weighting material comprising mixing the same in a watery pulp with a wetting agent, thincening and filtering the mixture, and calcining the residue. No. 2,280,034. Leslie Harrison, Jr. to Magnet Cove Barium Corp.

Method of conditioning barite as a weighting material comprising mixing the same with an organic wetting agent selected from the group consisting of primary, secondary, tertiary and quaternary amines, and calcining. No. 2,280,035. Leslie Harrison, Jr. to Magnet Cove Barium Corp.

Method of extracting an oil from an oil containing material, said method comprising providing the oil containing material with sufficient water within its structure so as to enable ice crystals to form upon freezing, subjecting the resultant material to a slow freezing condition so as to form relative large ice crystals therein and thereby so as to disrupt the oil cells therein, dehydrating the material so as to produce a firmer structure, subjecting the material to steam at an increased temperature and pressure, suddenly and instantaneously releasing to a lower temperature and pressure so as to disrupt the structure thereof, and then removing the oil therefrom. No. 2,280,046. Albert Musher to Food Manufacturing Corp.

Cyanoethylation of carbocyclic compounds. No. 2,280,058. Herman A Bruson to The Resinous Products & Chemical Co.

Oil having improved drying properties and comprising isano-oil and at least one oil selected from the group consisting of drying and

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semi-drying animal oils and drying and semi-drying vegetable oils. No. 2,280,082. Remmet Priester to Naamlooze Vennootschap Industrieele Maatschappij Voorheen Noury & Van Der Lande.

Sugar from sorghum juices. No. 2,280,085. Emil Ventre to Claude R. Wickard, as Secretary of Agriculture of the United States of America.

In process increasing the SO_3 content of sulfonated naturally occurring fatty materials, the step which comprises subjecting the sulfonated material to extraction with an organic, water-miscible solvent, in an amount at least equal to the volume of the sulfonated fatty material. No. 2,280,118. Bernard Dombrow to National Oil Products Co.

Process for manufacturing fertilizer. Nos. 2,280,129,-130. Herman Reinders-Folmer to Smith-Rowland Co., Inc.

Process preparing cuprous oxide which comprises mixing in water solution a cupric salt with sodium sulfite, to the resulting mixture adding sodium hydroxide, and separating the precipitate containing cuprous oxide. No. 2,280,168. William Stoddard, Jr.

In process producing alkyl halides, the steps of contacting olefins with a hydrogen halide in the presence of an ether solution of a complex compound formed by the interaction of a aluminum halide with ether, and effecting the hydrohalogenation reaction at a temperature of between about —10C. and about +50°C., thereby producing high yields of alkyl halides while inhibiting the polymerization of the olefins. No. 2,280,207. Hein Waterman and Jacob Leendertse to Shell Development Co.

Process partially esterifying 98 parts of maleic anhydride with 85 parts of ethylene glycol and esterifying the resulting product with 29 parts of methallyl alcohol to produce a resinous product. No. 2,280,242. Edward Kropa and Theodore Bradley to American Cyanamid Co.

Waxlike product and method of making the same from tall oil or rosin and fatty acids. No. 2,280,247. Ralph McKee and Helmer Blengsli.

Polymerization of maleic acid-linseed oil fatty acids-ethylene glycol-allyl alcohol resin. No. 2,280,256. Donald Patterson to American Cyanamid Co.

In process for destructive hydrogenation of hydrocarbon oils which comprises passing a hydrocarbon oil with added hydrogen through a reaction zone in contact with a hydrogenation catalyst at a pressure above 20 atmospheres and a temperature of about 350° to 510°C., to produce gasoline and middle oil, the step of introducing gaseous olefines into the reaction zone in an amount of at least 10 per cent by weight of the oil treated at a point where the oil has already undergone considerable splitting. No. 2,280,258. Mathias Pier to William E. Currie.

Composition comprising sulfur and a terpene polysulfide as a plasticizer for the sulfur. No. 2,280,301. Philip Ray to Hercules Powder Co.

Stabilized aromatic aldehyde containing not more than a fraction of a per cent of a thiourea having at least one free hydrogen attached to one of the thiourea nitrogens. No. 2,280,311. Richard Roblin, Jr. to American Cyanamid Co.

Method of rectifying mixed fluids which includes subjecting the mixed fluids to rectification into two principal vapor products, rectifying a portion of one principal vapor product by a liquid reflux produced by liquefying part of the rectified vapor in heat exchange with the other principal vapor product, withdrawing the unliquefied part of the rectified vapor as an auxiliary product of the rectification, and commingling the liquefied part after rectification with the first principal vapor product. No. 2,280,383. William De Baufre.

Mineral lubricating oil containing a small proportion of oil-soluble petroleum sulfonate and a small proportion of the salt of a weak non-carboxylic organic acidic material having an ionization constant not exceeding about 5X10-6. No. 2,280,419. Chester Wilson.

Phosphatidic composition. No. 2,280,427. Benjamin Thurman to Refining, Inc.

Process treating hydrocarbon oils, which comprises subjecting a paraffine base petroleum hydrocarbon and a chemically reactive aqueous solution of metallic chlorides and soluble metallic sulfates to elevated temperature at superatmospheric pressure in an enclosure for a period of time sufficient for partial decomposition of the hydrocarbon, flashing the mixture under controlled pressure conditions, separating and cooling the treated hydrocarbon. No. 2,280,445. Albert Ramsey Nevitt to Bradford Penn Refining Corp.

Process of recovering sulfuric acid from residual sulfuric acid liquor resulting from hydrolytic precipitation of metatitinic acid. No. 2,280,508. L'Roche Bousquet, Baldwin and Maxwell Brooks to General Chemical Co.

Method of treating magnesia and electrical insulating material derived therefrom. No. 2,280,516. Raymond Ridgway and Archibald Ballard to Norton Co.

An amide of a wholly aliphatic polycarbothionic acid, said acid having a chain of at least three carbon atoms between and contiguous with the thiocarbonyl groups. No. 2,280,578. William Hanford and Paul Salzberg to E. I. du Pont de Nemours & Co.

Method for recovering titanium values contained in residues obtained from titaniferous ore solutions. No. 2,280,590. Ignace Krchma to E. I. du Pont de Nemours & Co.

Mass capable of swelling and thickening comprising the precipitation—product of concentrated sulfite—lye with an excessive quantity of a strong mineral acid selected from the group consisting of hydrochloric acid and sulfuric acid, the mass being practically insoluble in water and possessing a limited and reversible swelling capacity. No. 2,280,600. Richard Muller and Harry Lee to Chemische Fabrik von Heyden, A. G.

Drying fiber string material. No. 2,280,602. Peter Plambeck to Armour and Co.

Preparing suture materials. No. 2,280,603. Peter Plambeck to Armour and Co.

Method for simultaneously producing an activated carbonaceous residue and producer gas. No. 2,280,611. Rudolf Adler.

Double salts of a compound of the class consisting of non-toxic alkali and alkaline earth metal quinates with a xanthine diuretic. No. 2,280,639. Robert Shelton to The Wm. S. Merrell Co.

In processes utilizing heat of reaction from an exothermic reaction occurring at a temperature in excess of about 500°C. for carrying out a reaction occurring at a temperature in excess of about 450°C., the improvement which comprises the use of a mixture of cuprous chloride and anhydrous halide of a polyvalent metal, said mixture having a melting point below 450°C. as a heat exchange medium. No. 2,280,673. Charles Thomas to Universal Oil Products Co.

In processes utilizing heat evolved during exothermic reaction for the carrying out of an endothermic reaction by the circulation of a heat exchange medium, the improvement which comprises using a mixture of aluminum chloride with an anhydrous halide of a bivalent metal as the heat carrying medium, said mixture having a melting point below 450°C. No. 2,280,674. Charles Thomas to Universal Oil Products Co.

Method of laminating a laminated product which comprises a plurality of laminated layers, at least two of which are joined together by a bituminous adhesive, which comprises bonding a lamina to the laminated product with a water-containing adhesive of the starchy type including not substantially less than 1% of water-insoluble metallic soap. No. 2,280,699. Francis Grant and Carl Wright to Lion Oil Refining Co.

Process of purifying starch of its fatty acids without hydrolysis of the starch which comprises suspending the starch in a hydrophilic fatty acid solvent capable of penetrating the starch granules to dissolve the fatty acids therein, heating and refluxing the material and filtering the same to remove the solvent and fatty acids. No. 2,280,723. Thomas Schoch to Corn Products Refining Co.

Leather

Process of bating hides which comprises subjecting them to the action of enzymes of aspergillus fumigatus in a dried culture of the mold, said enzymes being characterized by a uniformly high rate of proteolytic activity under alkaline conditions within a pH range up to about 9.5, and in the presence of ammonium sulfate. No. 2,279,908. Gilbert Ayres and Joseph Niedercorn to American Cyanamid Co.

Process of bating hides which comprises subjecting them to the action of enzymes of penicillium camemberti in a dried culture of the mold, said enzymes being characterized by a uniformly high rate of proteolytic activity under alkaline conditions within a pH range up to about 9.5, and in the presence of ammonium sufate. No. 2,279,909. Gilbert Ayres and Joseph Niedercorn to American Cyanamid Co.

Process of bating hides which comprises subjecting them to the action of enzymes of penicillium brevicaule in a dried culture of the mold, said enzymes being characterized by a uniformly high rate of proteolytic activity under alkaline conditions within a pH range up to about 9.5, and in the presence of ammonium sulfate. No. 2,279,910. Gilbert Ayres and Joseph Niedercorn to American Cyanamid Co.

Process of bating hides which comprises subjecting them to the action of enzymes of penicillium roqueforti in a dried culture of the mold, said enzymes being characterized by a uniformly high rate of proteolytic activity under alkaline conditions within a pH range up to about 9.5, and in the presence of ammonium sulfate. No. 2,279,911. Gilbert Ayers and Joseph Niedercorn to American Cyanamid Co.

Method lubricating skins and leathers comprising impregnating them with a product containing a lubricant element selected from the group consisting of vinifera palm oil and sulfated vinifera palm oil. No. 2,280,310. Robert Koppenhoefer and Theodore Roehner to Socony-Vacuum Oil Co.

Metals, Alloys

Blast Furnace Treatment of low grade manganese-iron ore. No. 22,063. Percy Royster.

Reclamation of fine dust from blast furnaces using manganese ores. No. 2,277,663. Charles B. Francis and Lawrence E. Riddle.

Zinc plating of ferrous articles. No. 2,277,664. Richard O. Hull to E. I. du Pont de Nemours & Co.

Process for electrodeposition of zinc from a sodium zincate bath. No. 2,277,668. Clayton F. Ruebensaal to E. I. du Pont de Nemours & Co.

Recovery of antimony. No. 2,278,134. William H. Osborn to Phelps Dodge Corp.

Magnesium base alloy containing from 0.01 to 3 per cent of palladium and characterized by a substantial improvement in at least one of the properties ductility, tensile strength, and yield strength as compared with magnesium without the palladium. No. 2,278,725. John MacDonald to The Dow Chemical Co.

Magnesium base alloy containing from 0.1 to 10 per cent of germanium and characterized by substantial improvement in at lest one of the properties ductility, tensile strength, and yield strength as compared with magnesium without the germanium. No. 2,278,726. John McDonald to The Dow Chemical Co.

Alloy for handling hot concentrated acetic acid. No. 2,278,765 Briant Branting to The Solvay Process Co.

Amethyst colored gold alloy. No. 2,278,812. Ludwig Weiss and Jakob Spaaner to Handy & Harman.

A tool surface formed of particles of titanium-cyano-carbide, embedded in a matrix of a chromum iron alloy. No. 2,279,003. Milan Matush to A. O. Smith Corp.

Method producing nickel iron powder. No. 2,279,013. Philip Roseby to Automatic Telephone & Electric Co. Ltd.

Method of briquetting chromite ore, comprising heating a quantity of finely divided chromite ore, mixed with from 1.5 to 3.5%, by weight, of clay. No. 2,279,033. Clinton Dolbear.

Method of treating an aluminum surface. No. 2,279,252,-253 Charles Slunder to Aluminum Co. of America.

Alloy consisting of the following ingredients in substantially the following proportions: nickel 9% to 16% by weight, copper 42% to 48% by weight, phosphorus .2% to 1% by weight, and zinc forming the balance of the mixture. No. 2,279,282. Rene Wasserman.

Alloy consisting of the following ingredients in substantially the following proportions: copper from 15% up to 50% by weight, nickel from at least 10.2% to approximately 18% by weight, silicon in small but effective amounts capable of increasing the hardness of the alloy and ranging from about .1% to 1% by weight, and zinc forming the balance. No. 2,279,283. Rene Wasserman.

Alloy consisting of silver from .2% to 12% by weight, copper from 10% to 50% by weight, nickel varying from 9% to 12% by weight, silicon varying from .1% to 1% by weight the balance being zinc. No. 2,279,284. Rene Wasserman.

Alloy of ten (10 percent to eighty (80) percent platinum, twelve (12) percent to ninety (90) percent palladium, and one (1) percent to fifteen (15) percent ruthenium. No. 2,279,763. Cecil Sivil to Baker & Co., Inc.

Hard Metal Tool Alloy. No. 22,073. Paul Schwarzkopf to American Cutting Alloys, Inc.

Method of producing a hard metal alloy. No 22,074. Paul Schwarzkopf to American Cutting Alloys, Inc.

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Flux for use in the melting of non-ferrous metals consisting of a mixture of anhydrous borax and air-slaked lime in the proportions ranging from substantially 1:1 to 1:2 of the two substances respectively. No. 2,279,565. James Fletcher to Frank Kuhn.

Metallurgical flux and method of using the same. No. 2,279,617. Lewis Chantler to The Standard Lime and Stone Co.

Magnesium Base alloy. No. 2,279,712. John McDonald to The Dow Chemical Co.

Soldering flux essentially comprising a substantially stable dispersion of at least one inorganic salt of the solder-flux type in a hydrocarbon vehicle substantially solid at normal temperatures and containing at least one member of the group consisting of petroleum mahogany sulfonic acid and alkali petroleum mahogany sulfonate. No. 2,279,828. Leo Liberthson to L. Sonneborn Sons, Inc.

Separating and separately recovering zinc and nickel. No. 2,279,900. Arthur Christensen to Internation Smelting & Refining Co.

Production of ferromanganese. No. 2,280,041. James C. Vignos to Ohio Ferro-Alloys Corp.

Method and agent for treating iron and steel. No. 2,280,063. James Critchett, Douglaston, and Walter Crafts to Electro Metallurgical Co.

Rolled copper alloy article. No. 2,280,103. Carl Swartz and Donald Schwartz to The Cleveland Graphite Bronze Co.

Aluminum alloys. Nos. 2,280,169 to 2,280,178. Philip Stroup to Aluminum Company of America.

Ferrous alloy having an analysis including between about .20 to about 1.00 per cent carbon, about 1.00 to 5.00 per cent chromium, about 1.00 to about 10.00 per cent cobalt, 3.00 to about 10.00 per cent molybdenum, about .40 to about 2.50 per cent silicon, about .40 to about 1.00 per cent manganese, and the remainder substantially all iron, said alloy being capable of being cast, and being characterized by freedom from heat checking and surface fissuring, toughness, wear-resistance, and freedom from hot metal scale pickup. No. 2,280,179. Jacob Trantin, Jr.

Welding rod having a core of hard alloy selected from the class of those comprising high carbon cobalt-chromium alloys and high carbon, cobalt-tungsten alloys and a coating on said core essentially comprising at least 30% of a carbide of a metal of the fourth, fifth and sixth groups and from about two to about ten per cent of a metal of the same groups. No. 2,280,223. Richard Dumpelmann and Paul Ehlers.

Method imparting increased deep-hardenability to a hardenable steel which comprises adding to such steel while it is molten between 0.1% and 2% of silicon, at least 0.001% but materially less than 0.05% boron, and at least one grain refining element in a total percentage greater than that required for grain refinement and between 0.03% and 1%. No. 2,280,283. Walter Crafts to Electro Metallurgical Co.

Method and agent for treating iron and steel. No. 2,280,284. James Critchett and Walter Crafts to Electro Metallurgical Co.

Method and agent for treating molten iron and steel. No. 2,280,285. James Critchett and Walter Crafts to Electro Metallurgical Co.

Addition agent and its use in the treatment of iron and steel. No. 2,280,286. James Critchett and Walter Crafts to Electro Metallurgical Co.

Preparation of ferro-chromium in blast furnaces. No. 2,280,452. Percy H. Royster.

Heat Treatment of metals. No. 2,280,470. Walter Bridges.

Process for granulating metals. No. 2,280,703. Russell Hart.

Process for purifying metals. No. 2,280,706. Thomas Jones to The American Metal Co., Ltd.

Paints, Pigments

Production or treatment of pigments and textile and other materials containing them. No. 2,278,540. George Ellis and Edmund Stanley to Celanese Corporation of America.

Manufacture of titanium dioxide pigments. No. 2,278,709. Walter Moran to National Lead Co.

Pigment for coloring ceramic compositions. No. 2,278,872. Charles Geary to E. I. du Pont de Nemours & Co.

Method for delustering and pigmenting. No. 2,278,878. George Hoff to E. I. du Pont de Nemours & Co.

Mica containing pigments and method of making the same. No. 2,278,970. Francis Atwood to Alantic Research Associates, Inc.

Water-base paint comprising pigment dispersed in an emulsion having as the continuous phase an aqueous casein solution whose initial viscosity has been reduced to a substantially constant value, and as the dispersed phase a drying oil-modified alkyd resin, and containing as a thickening agent a chemically stable organic compound from the group consisting of watersoluble alginates. No. 2,279,387. Harold Cheetham and Robert Myers to The Resinous Products & Chemical Co.

Preparation of fluorescent coating material. No. 2,279,877. William Sullivan to Westinghouse Electric & Mfg. Co.

Stable casein paste paint solution comprising casein completely solubilized in sodium orthophenylphenate. No. 2,280,246. Elmer Schuler to The White Co.

Paper Pulp

Method of treating a fibrous web comprising passing it through a dilute solution of glue and water, drying the web and then impregnating it with an aqueous solution of glue, glycerine and a water-insoluble metallic oxide in suspension, said solution having a pH range value of from about 9.2 to 9.8 and finally treating the coated web with a solution of formaldehyde and water. No. 2,279,549. John Behnke to Weycraft Paper Corp.

Method of impregnating paper in the form of rolls with a treating solution consisting of waxes dissolved in the carbon tetrachloride which comprises subjecting the rolls to successive soakings in said solution with intermediate removal of the solvent from the paper by the application of heat and suction, the soakings being carried out at a temperature above the boiling point of the solvent contained in said solution. No. 2,289,216. William Campbell and Ernest Massey to Imperial Tobacco Company of Canada.

Process of impreving the qualities of paper pulp. No. 2,280,307. Robert Diehm to Rohm & Haas Co.

Petroleum

Process reforming and polymerizing hydrocarbons. No. 2,277,938. Philip Subkow to Union Oil Co. of California.

Mixture comprising an allyl type primary sulfonate a rearrangement product thereof and a hydroxy sulfonate obtainable by reacting an aliphatic allyl type primary mono-chloride having at least five and less than 20 carbon atoms per molecule with sodium sulfite. No. 2,278,064. Martin de Simo' and John J. O'Connor to Shell Development Co.

Aldimine salts of petroleum sulfonic acids. No. 2,278,163. Melvin De Groote to Petrolite Corp.

Process for breaking petroleum emulsions. Nos. 2,278,164 to 2,278-171. Melvin De Groote and Bernhard Keiser to Petrolite Corp., Ltd.

Composition of matter comprising a lubricating oil fraction and a compound of general formula RxR′xR where R is an aryl or alkyl aryl or a substituted aryl or alkyl aryl group, x is an element taken from the group sulfur or tellurium, and R′ is an alkyl group. No. 2,278,224. Philip Subkow.

Process for converting hydrocarbon oil into substantial yields of high antiknock gasoline. No. 2,278,228. Kenneth M. Watson to Universal Oil Products Co.

Process of producing lubricating oils by polymerizing olefin hydrocarbons contained in a hydrocarbon gas mixture. No. 2,278,445. Carl Hull to Standard Oil Co.

Removal of Sulfur from organic substances. No. 2,278,498. Bernard Shoemaker to Standard Oil Co.

Process revivifying a solid catalyst-mass which becomes impaired by contact with excessive amounts of steam at high temperatures and upon which is deposited a coke-like material. No. 2,278,509. Will Brown to Standard Oil Company.

Process for converting mercaptan compounds contained in the petroleum oil to disulfide compounds. No. 2,278,665. Henry Paulsen to Standard Oil Development Co.

Catalytic reaction of olefins. No. 2,278,677. Eldon Stahly and Erwin Hattox to Standard Oil Development Co.

Bituminous emulsion. No. 2,278,684. Willard Asbury and Frederic Garner to Standard Oil Development Co.

Method of synthesizing sulfurbearing, high molecular weight hydrocarbons. No. 2,278,719. Lloyd Davis, Bert Lincoln and Gordon D. Byrkit to Continental Oil Co.

Process preparing a catalytic material useful in hydrocarbon conversion reaction. No. 2,278,746. John Sturgeon to Universal Oil Prods. Co.

Method of recovering liquefiable hydrocarbons from gases or gaseous fluids. No. 2,278,750. Jay Walker to Eureka Process Corp.

Sweetening of petroleum distillates by treatment with plumbite and elementary sulfur. No. 2,278,753. Charles Wirth, III, to Universal Oil Prods Co.

Lubricant. No. 2,278,762. Daniel Bergen to Philips Petroleum Co.

Reactivating catalysts. No. 2,278,836. Roland Day to Universal Oil Products Co.

Process preventing water-in-oil type emulsions resulting from acidization of calcareous oil-bearing strata. No. 2,278,838. Melvin De Groote and Bernhard Keiser to Petrolite Corporation, Ltd.

Drill mud including an amount of watersoluble hexaphosphate dinitride sufficient to reduce markedly the viscosity of said drill mud. No. 2,278,841. Thomas Dunn to Stanolind Oil & Gas Company.

An anti-wear lubricant comprising a mineral lubricating oil containing dissolved small amounts of a free aliphatic unsaturated ketone and an anti-wear compound which is substantially non-corrosive under lubricating conditions, and contains as its active ingredient a semi-metallic element capable of forming with bearing metals alloys having melting points substantially lower than said metals. No. 2,278,851. Eric Hillman to Shell Development Co.

Method removing mud barriers from oil wells. No. 2,278,909. Theodore Bertness, Norris Johnston and Daniel Newton to Socony-Vacuum Oil Co.

Method for locating subterranean carboniferous deposits. No. 2,278,-929. Leo Horvitz to Esme E. Rosaire.

Process and catalyst for conversion of normal paraffins. No. 2,278,-934. Milton Lee to Union Oil Co. of Calif.

In method of coating mineral aggregate, the improvement which comprises treating the aggregate with a dilute solution of an alkali metal salt of petroleum hydrocarbon-aromatic sulfonic acids prior to contacting the aggregate with bituminous material. No. 2,278,954. Robert Thurston to The Texas Co.

Recovery of hydrocarbons from fuel gases. No. 2,278,999. Paul Kuhl to Standard Oil Development Co.

Flushing oil for cleaning internal combustion engine crankcases having a kauri butanol solvent value between about 40 and 200 and to which has been added at least about 10% of at least one normally liquid material selected from the group consisting of aromatic hydrocarbons and halogenated hydrocarbons. No. 2,279,001. George Matheson and Raphael Rosen to Standard Oil Development Co.

Process for synthesis of hydrocarbons with more than one carbon atom in the molecule and contingently minor amounts of from liquid to solid oxygen-containing derivatives thereof by conversion of carbon monoxide with hydrogen. No. 2,279,052. Wilhelm Michael and Ernest Plauth to Standard Catalytic Co.

Lubricating oil suitable for internal combustion engines containing dissolved from .25%-5% of a sulfonate salt and from 1%-10% of a sulfurized ester. No. 2,279,086. Roland Bergstrom to Shell Development Co.

Process for removing gum-forming constituents from cracked motor fuel distillates. No. 2,279,195. Heinz Heinemann to Forward Process Co.

Catalytic conversion of hydrocarbons. No. 2,279,198-199. Walter Huppke to Union Oil Co. of Calif.

Improved mineral oil composition comprising a viscous mineral oil fraction and in admixture therewith a minor proportion of a reaction product obtained by first reacting a phosphrous pentahalide with an aromatic hydroxycarboxylic acid and then reacting the product thus obtained with a compound selected from the group consisting of: ammonia, organic compounds containing replaceable hydrogen and compounds containing reactive metal atoms. No. 2,279,218. Darwin Badertscher, Robert Williams and Henry Berger to Socony-Vacuum Oil Co., Inc.

A pumpable cement slurry for cementing oil wells having incorporated therein a finely divided, suspended metal. No. 2,279,262. Donald Edwards to Continental Oil Co.

Isomerizing hydrocarbons. Nos. 2,279,291,-292. Harry Cheney to Shell Development Co.

Process treating mineral oil distillates for effecting the separation of sludge and sludge forming impurities. No. 2,279,461. Emil Hene.

Process producing anti-knock motor fuel from crude petroleum. No. 2,279,547. Gordon Zimmerman to Universal Oil Products Co.

In conversion of hydrocarbons wherein hydrocarbon oil is catalytically

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cracked and insufficiently converted products separated from gasoline and gas, the method which comprises extracting said products with a selective solvent, hydrogenating the resultant extract, and returning the hydrogenated extract to the catalytic cracking the operation. No. 2,279,550. Wayne Benedict and Jacob Ahlberg to Universal Oil Products Co.

Viscous petroleum oil normally subject to deterioration in color having incorporated therein a small proportion of a condensation product of 1 mole of an aliphatic polyamine in which two amino groups are primary amino groups directly attached to different aliphatic carbon atoms with from 3 to 10 moles of an aliphatic aldehyde of at least 3 carbon atoms having at least one hydrogen atom on the carbon adjacent to the —CHO group. No. 2,279,561. Melvin Dietrich to E. I. du Pont de Nemours & Co.

Catalytic conversion of hydrocarbons. No. 2,279,703. William Bradley and John Volz to Union Oil Co. of Calif.

Method of distilling crude petroleum oil which comprises mixing para-cymene with the crude oil, heating the mixture to a temperature to cause flocculent precipitation of the wax from the oil and the light ends to pass off. No. 2,279,937. Thomas Brown.

Improved mineral oil composition comprising a mineral oil having admixed therewith a minor proportion of an oil-miscible alkylated amino-aryl metal oxide. No. 2,280,039. Orland Reiff and Howard Hartough to Socony-Vacuum Oil Co., Inc.

An improved fuel for compression-ignition engines of the Diesel type which comprises hydrocarbon fuel having a flash point above 150°F. and a small amount of an alkyl nitrate having at least 10 carbon atoms per molecule. No. 2,280,217. Gould Cloud to Standard Oil Development Co.

Refining of petroleum distillates. No. 2,280,227. Bruce Gillespie to Standard Oil Development Co.

Solvent dewaxing process. No. 2,280,260. Oldrich Polorny to Standard Oil Development Co.

Solvent treating process. No. 2,280,264. Edward Reeves to Standard Oil Development Co.

Liquid mineral lubricating oil containing in the order of about three-fourths of 1% to 2.5% of an oil-soluble carboxylic acid soap. No. 2,280,338. David Merrill to Union Oil Co. of Calif.

Hydrocarbon oil composition comprising a relatively large proportion of a refined hydrocarbon oil normally tending to deteriorate by oxidation under normal conditions of use and in intimate admixture therewith a relatively small amount sufficient to inhibit such deterioration, of an oil-soluble, water-insoluble reaction product of tricresyl phosphite and octyl phenoxy-ethanol. No. 2,280,450. Raymond Reuter to The Atlantic Refining Co.

Lubricant comprising in combination a major proportion of an oil having lubricating characteristics and a minor proportion of a metal salt of an organic acid containing an ester group elsewhere in the molecule. No. 2,280,474. Gordon Byrkit, Waldo Steiner and Bert Lincoln to Socony-Vacuum Oil Co., Inc.

Lubricant comprising in combination a major proportion of an oil having lubricating characteristics and a minor proportion of a metal salt of a hydroxy acid whose hydroxyl group is esterified. No. 2,280,475. Gordon Byrkit, Waldo Steiner, and Bert Lincoln to Socony-Vacuum Oil Co., Inc.

Manufacture of catalysts. No. 2,280,649. Elmer Kanhofer to Universal Oil Prods Co.

Manufacture of catalysts. No. 2,280,650. Louis Kassel to Universal Oil Prods. Co.

Improved asphaltic material for road construction and the like comprising a bituminous binder consisting of bitumen and .5 to 5.0% of an ester of a higher fatty acid and a high molecular weight monohydric alcohol and a siliceous mineral aggregate thoroughly incorporated with the binder. No. 2,280,653. Charles Mack to Standard Oil Development Co., a corp. of Delaware.

Isomerization process. No. 2,280,710. Charles Lynch to Standard Oil Development Co., a corp. of Delaware.

Compression-ignition engine fuel comprising a hydrocarbon Diesel fuel oil, 0.1% to 5% of nitrogen tetrasulfide, and an amount of 1-mercaptobenzothiazole effective to substantially lessen the normal deterioration of the said nitrogen tetrasulfide. No. 2,280,716. Henry Paulsen and John Collins to Standard Oil Development Co., a corp. of Delaware.

Isomerization of normal paraffins. No. 2,280,748. Van Calhoun to Standard Oil Development Co., a corp. of Delaware.

Resins, Plastics

Polysulfide polymeric product. No. 2,278,127. Joseph C. Patrick to Thiokol Corp.

Desulfurized polysulfide polymer and process of making. No. 2,278,128. Joseph C. Patrick to Thiokol Corp.

Manufacture of plasticized polyvinyl chloride filaments, sheets, etc. No. 2,278,231. James G. E. Wright to General Electric Co.

Composition of matter comprising a synthetic linear polyamide and an amino-hydrogen-containing aromatic amine. No. 2,278,350. George DeWitt Graves to E. I. du Pont de Nemours & Co.

An organic polysulfide plastic. No. 2,278,368. Walter Frost, Kries Schweidnitz to Silesia Verein Chemischer Fabriken.

Condensation products of aldehydes and urea derivatives. No. 2,278,374. John F. Olin to Sharples Chemicals, Inc.

Condensation products of aldehydes and urea derivatives. No. 2,278,375. John F. Olin to Sharples Chemicals, Inc.

Copolymerized substance comprising a formyl group. No. 2,278,528. Carl Barnes to E. I. du Pont de Nemours & Co.

Resins comprising the acrylic and methacrylic acid esters of the hydoxybiphenyls. No. 2,278,634. Carl Barnes to E. I. du Pont de Nemours & Co.

Resin comprising copolymers of divinly detone and diisopropenyl ketone. No. 2,278,635. Carl Barnes to E. I. du Pont de Nemours & Co.

Resin of interpolymerized substances comprising acrylic or methacrylic anhydride. No. 2,278,636. Carl Barnes to E. I. du Pont de Nemours & Co.

Resin of Interpolymerized substances comprising acrylic or methacrylic anhydride. No. 2,278,637. Carl Barnes to E. I. du Pont de Nemours & Co.

Composite materials comprising fibers reinforced by a binding agent, said binding agent consisting of at least partially fused fibers of a water-insoluble vinyl resin, said resin having an avearge macromolecular weight of at least 75,000. No. 2,278,895. Edward Rugeley, Theophilus Feild, Jr. and John Conlon to Carbide and Carbon Chemicals Corp.

Composite materials comprising staple fibers of a water-insoluble vinyl resin having an average macromolecular weight of at least 75,000, said staple fibers being at least partially heat-fused with staple fibers of at least one other textile material. No. 2,278,896. Edward Rugeley, Theophilus Feild, Jr. and John Conlon to Carbide and Carbon Chemicals Corp.

Process for production of moldable artificial masses comprising mixing practically water-free solutions of methylol ureas with casein in proportions to form a moist sticky powder, pressing the still moist product into a homogeneous body at a temperature between 70° to 120°C. and hardening the same at a temperature not exceeding 120°C. No. 2,279,743. Fritz Pollak.

Polyamide capable of being formed into fibers showing by characteristic X-ray pattern orientation along the fiber axis. No. 2,279,745. Halsey Stevenson to E. I. du Pont de Nemours & Co.

Resinous polyamide which yields continuous solid films and which comprises the product obtained by heating to polymerizing temperature a composition consisting essentially of bifunctional polyamide-forming material which provides complementary amide-forming groups and which comprises a reactant containing a ketone group in the chain of atoms separating its amide-forming groups. No. 2,279,752. Ralph Jackson to E. I. du Pont de Nemours & Co.

Process for making resins. No. 2,279,764. Sidney Smith and Russell Van Ness to E. I. du Pont de Nemours & Co.

Method producing modified urea-aldehyde resins. No. 2,279,312. Samuel Gutkin to Falk & Co.

Process polymerizing vinyl compounds. No. 2,279,436. Herbert Berg to Chemische Forschungsgesellschaft, m. b. H.

Composition of matter comprising nitrostarch and an alkyd resin characterized by being hardenable in air at a temperature below 120°C. No. 2,279,438. Walter Bowlby to Trojan Powder Co.

Process reacting thiourea with formaldehyde at room temperature to produce a condensation product, the reaction being carried out at a greater alkalinity than pH 10 until the reaction products are incipiently hydrophobic and hardening the reaction products under alkaline conditions to produce infusible and insoluble materials, the reaction products being substantially free from urea. No. 2,279,493. Kurt Ripper to American Cyanamid Co.

Asymmetrical condensation products and process of preparing same. No. 2,279,497. Richard Sallmann and Otto Albrecht to Society of Chemical Industry in Basle.

Process of preparing compositions which comprises mixing a hardenable phenol-aldehyde condensation product with an oxidized air-drying fatty oil in a solvent for both components and thereafter removing the solvent. No. 2,279,499. Fritz Seebach to Bakelite Corp.

Method preparing a thermosetting resin capable of being cured without further addition of catalyst which comprises condensing with an aldehyde the material obtained upon heating dicyandiamide and a phenol until from 0.07 to 0.18 mole of ammonia per mole of dicyandiamide are evolved while maintaining the pH at a relatively constant value between about 9.1 and 9.5 throughout the aldehyde condensation. No. 2,279,512. Frank Groten and James Lower to American Cyanamid Co.

Soluble phenolic resin. No. 2,279,526. Israel Rosenblum.

Formation of plastic sheets. No. 2,279,901. Dario Parma to Carbide and Carbon Chemicals Corp.

Rubber

Rubber composition and method of preserving rubber. No. 2,278,046. Robert L. Sibley to Monsanto Chemical Co.

Method of improving adhesion of rubber to fabrics. No. 2,278,355. Edward T. Lessig and Ivan Gazdik to The B. F. Goodrich Co.

Method of making porous rubber and compositions employed therein. No. 2,278,441. Marion Harrison and Louis Gould to The B. F. Goodrich Co.

Method of preserving rubber which comprises incorporating therein a methallyloxy diarylamine. No. 2,278,558. Philip Paul to The United States Rubber Co.

Composite product comprising natural rubber and synthetic rubber and method for making the product. No. 2,278,802. Donald Sarbach to The B. F. Goodrich Co.

Method preparing a non-staining reclaimed rubber composition which comprises admixing vulcanized rubber, an adsorbent material, and a water-insoluble soap and thereafter reclaiming the rubber by heating the mixture in the presence of an alkali. No. 2,278,826. Allen Castello and Henry Dixon to The B. F. Goodrich Co.

Process for the production of rubberlike binding agent for fiber substances. No. 2,278,943. Carl Oesterreich.

An ink roller comprising a body of sulfurized isobutylene-butadiene polymer material. No. 2,278,982. Per Frolich to Standard Oil Development Co.

An alkali digestion process of reclaiming fibre-containing vulcanized rubber scrap to produce directly in one operation in shortened time, a softened substantially cellulose-free reclaim. No. 2,279,047. Walter Kirby and Leo Steinle to United States Rubber Co.

Method preparing a composition for use in hot melt coating, which method comprises heating to a molten condition a composition comprising a polyamyl naphthalene and a condensation derivative of rubber obtained by reacting rubber with a phenol and an acid isomerizing agent. No. 2,279,557. William Calvert to Marbon Corp.

Method of preventing adhesion between a mold and a heat-moldable plastic material being heat-molded therein which comprises interposing between the mold surface and the plastic material a composition comprising a carbonate compound capable of being decomposed during the heat-molding operation to release gaseous carbon dioxide. No. 2,279,859. Richard Crawford to B. F. Goodrich Co.

Method treating a rubber surface to improve its wetting characteristics which comprises applying to the surface a solution containing not more than 5.0% by weight of rosin dissolved in a volatile solvent and then evaporating the solvent. No. 2,279,860. Richard Crawford to The B. F. Goodrich Co.

Process vulcanizing rubber in the presence of a member of the class consisting of the mercaptoquinolines, their salts, and diquinolyl sulfides. No. 2,279,875. Waldo Semon to The B. F. Goodrich Co.

Reclaiming of vulcanized rubber scrap by heating the same in the presence of a condensation product of a monoaryl hydrazine and a member of a group consisting of aldehydes and ketones at a temperature of about 100-160°C. No. 2,280,484. Walter Gumlich to General Aniline & Film Corp.

Textile Patents for above volume will be given next month.

Foreign Chemical Patents
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Abstracts of Foreign Patents

Collected from Original Sources and Edited

Those making use of this summary should keep in mind the following facts:

Belgian and Canadian patents are not printed. Photostats of the former and certified typewritten copies of the latter may be obtained from the respective Patent Offices.

English *Complete Specifications Accepted* and French patents are printed, and copies may be obtained from the respective Patent Offices.

In spite of present conditions, copies of all patents reported are obtainable, and will be supplied at reasonable cost.

This digest presents the latest available data, but reflects the usual delays in transportation and printing. Your comments and criticisms will be appreciated.

BRITISH COMPLETE SPECIFICATIONS

Accepted and Published November 13, 1940.

Manufacture of abrasive articles. No. 528,563. Norton Grinding Wheel Co., Ltd.

Hard metal alloy. No. 528,565. Cutanit, Ltd.

Reduction of the viscosity of confection compositions and viscosity reducing agents therefor. No. 528,377. American Lecithin Company.

Process for hardening gelatine. No. 528,447. Kodak, Ltd.

Production of dyes of the cyanine type and improved photographic emulsion. No. 528,574. Kodak, Ltd.

Heat treatment of metals. No. 528,625. C. I. Hayes.

Making continuous sheets or strips of a cellulose derivative. No. 528,382. Kodak, Ltd.

Coloration of textiles and other materials. No. 528,450. P. F. C. Sowter.

Methods of producing steel and compositions for use in such methods. No. 528,578. E. H. Clark and R. F. Dirkes.

Method of producing liquid nitrogen tetroxide. No. 528,387. E. I. du Pont de Nemours & Co., Inc.

Production of artificial filaments, ribbons, and the like. No. 528,455. E. I. du Pont de Nemours & Co., Inc.

Apparatus for testing the adhesion of protective coatings. No. 528,585. H. R. Priston, A. W. Hothersall and C. J. Leadbeater.

Insecticidal compositions. No. 528,516. E. I du Pont de Nemours & Co., Inc.

Treatment of furs or skins. No. 528,459. C. W. Martin & Sons, Ltd.

Reaction units for blood sugar test. No. 528,520. E. Lilly & Co., et al.

Reaction units for urine albumin test. No. 528,521. E. Lilly & Co. et al.

Method of producing frozen confections resembling ice cream and fatty preparations adapted to be used therein. No. 528,397. Lever Bros. & Unilever, Ltd. et al.

Paint and its manufacture. No. 528,526. H. Matthews & Co., Ltd. et al.

Manufacture of artificial textiles. No. 528,428. A. Ferretti.

Methods of coating fabrics. No. 528,435. International Latex Processes, Ltd.

Polycarbamide. No. 528,437. E. I. du Pont de Nemours & Co., Inc.

Synthetic resins. No. 528,438. Norton Grinding Wheel Co., Ltd.

Method of imitating vegetation for camouflaging purposes. No. 528,465. S. Lorenc.

Process for the manufacture of resinous condensation products. No. 528,479. Beck, Koller & Co. (England), Ltd.

Electrodeposition of nickel. No. 528,498. Harshaw Chemical Company.

Method and apparatus for splicing unvulcanized indiarubber tubes. No. 528,539. Firestone Tyre and Rubber Co., Ltd.

Conversion of heavy liquid fuel into combustible gas. No. 528,540. Eastern Oil Refining Co., Inc.

Separation or thickening of suspensions in coal-washing plants. No. 528,590. De Directie van de Staatsmijnen in Limburg.

Apparatus for treating articles with liquid or gaseous agents. No. 528,598. Wacker Ges. fur Elektrochemische Industrie Ges.

Refining hydrocarbon mixtures in vapor phase. No. 528,610. N. V. de Bataafsche Petroleum Mij.

Refining hydrocarbon mixtures in the vapor phase. No. 528,611. N. V. de Bataafsche Petroleum Mij.

Conversion of carbon monoxide with hydrogen into hydrocarbons having more than one carbon atom in the molecule. No. 528,617. N. V. Internationale Koolwaterstoffen Synthese Mij.

Process for the manufacture of asphalt from products containing both asphalt and paraffin wax. No. 528,653. N. V. de Bataafsche Petroleum Mij.

Water softening apparatus. No. 528,672. Electrolux, Ltd. et al.

Manufacture of cellulose derivatives. No. 528,674. British Celanese, Ltd.

Treating metals to provide a coating or film thereon. No. 528,558. C. D. Abell.

CANADIAN PATENTS

Granted and Published July 15, 1941.

Process for the manufacture of alkylolamines which comprises forming an N. oxyalkyl compound by reacting an oxyalkylating agent with a primary or secondary amino radicle attached to a carbonyl group contained in an aliphatic compound, and then splitting off the group or groups originally attached to the amino radicle by hydrolysis. No. 397,909. Henry Dreyfus.

Process for the manufacture of cellulose comprising treating lignocellulosic materials with a 7 to 10 per cent aqueous solution of a caustic alkali, the amount of the caustic alkali being between 35 and 50% of the weight of the materials, at a temperature between 150° and 165°C. for at most, 5 hours. No. 397,910. Henry Dreyfus.

A cathode comprising a metallic conductive core, an intermediate layer of anhydrous barium hydroxide on said core, and a surface layer of electron emissive material on said barium hydroxide. No. 397,953. Canadian Westinghouse Company, Limited. (John W. McNall).

An ester of an acid of phosphorus containing as an esterifying radicle a ketonyl radicle containing from 3-6 carbon atoms and free from hydroxy groups. No. 397,958. Celluloid Corporation. (Walter D. Paist).

A process of water softening comprising first treating the raw water with lime to remove temporary hardness, then passing the water over sulfonated coal to remove free lime and calcium carbonate, and finally passing the water over a zeolite softener, said sulfonated coal having been obtained by treating a member of the group consisting of bituminous coal and anthracite coal with a sulfonating agent until base exchange properties have developed. No. 397,960. Joseph Crosfield & Sons, Ltd. (Reginald Furness and Harold J. Wheaton).

Method of decarburizing carbon-containing metal comprising forming highly superheated molten bath of such metal, maintaining at least a substantial part of the top surface of the bath substantially free from slag, maintaining an atmosphere of hydrogen over said bath and in contact with said top surface, and maintaining an electric arc in said atmosphere adjacent the bath to heat said hydrogen to a temperature above the melting point of said metal. No. 397,968. Electro Metallurgical Company of Canada, Limited. Augustus B. Kinzel.

Austenitic alloy steel containing between 12 and 25% chromium, between 6 and 14 per cent of an austenitic-promoting element of the group consisting of manganese and mixtures of manganese and nickel wherein the proportion of manganese is greater than that of nickel, carbon in an amount not over 0.2%, 0.05-0.5% nitrogen, and the remainder iron. No. 397,969. Electro Metallurgical Company of Canada, Ltd. (Frederick M. Becket and Russell Franks).

Process for the manufacture of naphthacetyl-amino acids. No. 397,981. Hoffmann-LaRoche, Ltd. (Otto Isler).

A non-detonating blasting explosive comprising a compound selected from the group consisting of the ammonium and alkali metal hypophosphites, and a salt mixture containing an ammonium salt selected from the group consisting of ammonium sulfate, carbonate, bicarbonate, and chloride and a second salt taken from the group consisting of the alkali and alkaline earth nitrates, said salt mixture being adapted to form by metathesis a mixture of ammonium nitrate and a cooling salt selected from the group consisting of the sulfates, carbonates, bicarbonates, and chlorides of the alkali or alkaline earth metals. No. 397,984. Imperial Chemical Industries, Ltd. (Alexander T. Tyre).

An antigen specific to the diagnostic determination of tuberculosis by intradermal injection comprising a substantially neutralizing alkaline hydroxide extract of fibrin taken from the blood of an animal or human having tuberculosis. No. 397,991. Lakeland Foundation. (Benjamin Gruskin).

In a process of ore concentration, the step comprising subjecting the ore in aqueous pulp to a concentrating operation in the presence of an organic-substituted isourea compound in which the substituted group is attached to oxygen and consists of the hydrocarbon residue of an organic hydroxy compound. No. 397,998. Minerals Separation North American Corporation. (William Trotter and Eltoft W. Wilkinson).

In a process of manufacturing cement, the steps which comprise passing finely divided cement raw materials between a pair of continuously rotating electrodes maintained at a high difference of uni-directional voltage and in close proximity to one of them, separating the finely divided cement raw material into a plurality of discrete portions by the selective action of the electrostatic field between the electrodes, and individually collecting the separated portions. No. 398,012. Ritter Products Corporation. (Herbert B. Johnson).

Apparatus adapted for the production of desiccated biologically active and other material sealed in evacuated container. No. 398,014. Sharp & Dohme, Incorporated. (Courtland H. Barr).

Method of manufacturing gasoline and fuel oil from asphaltic petroleum stocks containing a high boiling wax bearing fraction of the type generally occurring in California. No. 398,016. Sinclair Refining Company. (John J. Downey and William W. Murray).

A liquid composition containing a nitrogenous base which normally has a corrosive action on iron and an alkaline earth metal compound which is convertible by aqueous carbon dioxide into a water-insoluble carbonate, said compound being present in an amount sufficient to materially inhibit the corrosive action of the nitrogenous base on iron. No. 398,025. Henry Dreyfus.

Foreign Chemical Patents
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Foreign Chemical Patents

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Manufacture of stiffening bandages by combining with bandages of any kind at least one polyvinyl compound which is insoluble in water but is satisfactorily soluble in organic solvents and which is selected from the group consisting of the derivatives of polymerized vinyl alcohol and the polymerized vinyl derivatives of the aromatic hydrocarbons and adding at least one member selected from the group of substances modifying the flexibility and the swelling power of said water-insoluble polymerized vinyl compounds and consisting of hydrophilic polymerized vinyl compounds, polymerized acrylic and methacrylic acid and derivatives of such acids, and compounds of the class of caoutchouc, cellulose derivatives and softeners. No. 398,027. Chemische Forschungsgesellschaft m.b.H. (Willy O. Herrmann and Bernd Braun).

A new adhesive comprising a starch and a melamine aldehyde condensation product. No. 398,028. Henkel & Cie., G.m.b.H. (Rudolf Köhler).

Process of preparing cement and alkali metal aluminate. No. 398,037. Walter Noll.

Process of coating a gelatine layer on top of support consisting of polymerized vinyl chloride. No. 398,038. Kurt Thinius.

Method for the asceptic preservation of the juice of fruits, vegetables and the like by the multistage electrical treatment thereof by means of alternating currents. No. 398,039. Felix Trzoska.

Granted and Published July 22, 1941.

Process for the production of dense compressed fibre product. No. 398,041. George D. King and Joseph W. Gill.

Apparatus for coating metal strip with metal in molten form. No. 398,042. Raymond John Wean and Harry William Theiss.

Method of producing leather-like material comprising applying a resilient adhesive coating to a fibrous base, depositing cut fibres on the surface in continuous form to adhere the same thereto, saturating the thus flocked fibres to adhere the same thereto, saturating the thus flocked fibres with a solution containing tannable protein material, and tanning such material after saturation. No. 398,043. Reymond C. McQuiston and Henry C. Hopewell.

Manufacture of elemental sulfur in exceedingly pure state by absorbing sulfur dioxide in a solution alkali carbonate, whereby carbon dioxide and sodium sulfite solution are produced, reacting said sodium sulfite solution with hot barium sulfide solution, whereby barium sulfite is precipitated and sodium sulfide solution is produced, reducing said barium sulfite with carbon, whereby barium sulfide is produced, recycling said barium sulfide, absorbing said carbon dioxide in said sodium sulfide solution, whereby sodium carbonate solution and hydrogen sulfide are produced, recycling said sodium carbonate solution, with sulfur dioxide just entering the process, and finally oxidizing said hydrogen sulfide to elemental sulfur. No. 398,051. Gant Gaither.

Process of forming a hard, dense, consolidated product consisting essentially of cellulosic and ligneous fibres in an interlaced condition. No. 398,054. Harry K. Linzell.

Process of rendering commercial dry-roasted dextrine non-lumping when mixed with water which comprises subjecting the dextrin in the dry state for a period of from about 3 to about 5 minutes to a temperature of from about 70° to about 130°C. between heated plates under a pressure of about one pound per square inch. No. 398,071. Philip Dalton Coppock.

Process which comprises causing a di-(beta-halo-genalkyl)-amine of the formula

$$\text{Hlg. CHR. CHR, N. CHR. CHR. Hlg.}$$
$$\text{R}$$

wherein R stands for a member of the group consisting of hydrogen and a monovalent hydrocarbon radical, to react with an arylacetonitrile in the presence of an agent capable of splitting off hydrogen halide. No. 398,076. Alba Pharmaceutical Company, Inc. (Otto Eisleb).

A method of calcining gypsum which includes continuously feeding the material in a stream through a flame at greater than a calcining temperature. No. 398,077. American Cyanamid and Chemical Corporation. (John G. Brush).

Apparatus for the manufacture of laminated glass. No. 398,078. American Window Glass Company. (Charles S. Shoemaker).

A composition of matter consisting of vegetable oil and from 25 to 50% by weight of the whole of an alkyl phosphate ester having the empirical formula RPO_4, where R comprises an alkyl radical containing not exceeding four carbon atoms. No. 398,090. Canadian General Electric Company, Ltd. (Frank M. Clark).

A fluorescent material comprising heat-treated magnesium oxide, silica and an exciter. No. 398,092. Canadian General Electric Company, Ltd. (Ralph P. Johnson and Gordon R. Fonda).

Fluorescent material emitting light in the red spectral region under excitation by radiation from a gaseous electric discharge consisting of a sintered mixture consisting of magnesium oxide and titanium dioxide in which the titanium dioxide content is at least 2% and not more than 53% by weight of the total content of magnesium oxide and titanium dioxide, said material in combination with a gaseous electric discharge lamp device. No. 398,093. Canadian General Electric Company, Ltd. (Erich Krautz).

A molding composition comprising a polyvinyl acetal resin and beta naphthol. No. 398,098. Canadian Industries, Ltd. (Roger G. Aitken).

A composition comprising polyvinyl alcohol treated with cuprammonium hydroxide solution. No. 398,099. Canadian Industries, Ltd. (William W. Watkins).

Method of retarding the deterioration of rubber, due to the catalytic effect of copper in contact with rubber, in the presence of an antioxidant which is normally effective to materially retard the deterioration of rubber due to light, heat and oxidation in the absence of copper but which is less effective in the presence of copper. No. 398,101. Canadian Industries, Ltd. (Frederick Baxter Downing and Charles John Pedersen).

Method of retarding the deterioration of rubber, due to the catalytic effect of copper in contact with rubber, in the presence of an antioxidant which is normally effective to materially retard the deterioration of rubber due to light, heat and oxidation in the absence of copper but which is less effective in the presence of copper. No. 398,102. Canadian Industries, Ltd. (Frederick B. Downing, Charles J. Pedersen and Arthur M. Neal).

Process for vulcanizing a rubber composition in juxtaposition with a preformed body of thermoplastic material in the absence of substantial intermingling thereof. No. 398,103. Canadian Industries, Ltd. (Myrle H. English and Roland R. Nydegger).

An acyclic monoaminonitrile containing from 6 to 20 carbon atoms and in which the amino and nitrile groups are separated by a chain of at least 5 carbon atoms contiguous therewith. No. 398,104. Canadian Industries, Ltd. (George W. Rigby).

Improving the resistance of synthetic linear polyamides toward discoloration on exposure to light or heat by treating with a solution of alkaline reagent having a concentration equivalent to that of sodium hydroxide solution from about 0.01 to 5% concentration. No. 398,105. Canadian Industries, Ltd. (John K. Owens and Arthur G. Scroggie).

A composition of matter comprising a polyvinyl resin and a member of the group consisting of the polymers and hydrogenating polymers of dihydronaphthalene and its homologs. No. 398,106. Canadian Industries, Ltd. (Roger G. Aitken).

Producing sorptive carbon by heating a mass of comminuted carbonaceous material at elevated temperatures above 700°C. in contact with an oxidizing agent, establishing a substantial temperature gradient within said mass, and providing a concentration of the oxidizing agent greater in the cooler portions of said mass than in the hotter portions thereof. No. 398,122. Carbide and Carbon Chemicals, Ltd. (Victor C. Hamister).

Electrolytic cell. No. 398,123. Chemical Construction Corporation. (William J. Rosenbloom).

Manufacture of melamine wherein a compound of the formula $NH_2(\text{-C-NH-})xH$ (NH) in which x is a number smaller than 3 is treated in a closed vessel at a raised temperature. No. 398,124. Ciba Products Corporation. (Willi Fisch).

Pulp digesting apparatus having circulating system. No. 398,136. Foster Wheeler Corporation. (Dion K. Dean).

Wax-backed carbon paper having on its back and distributed uniformly over a predominant area thereof a layer of opaque pigment of a color which contrasts with the color of the front of the paper. No. 398,143. Kores Manufacturing Company, Ltd. (Richard Lant).

Method and apparatus for coating paper. No. 398,147. Lowe Paper Company. (George F. Whiting, Jr. and Fred Kabela).

Vulcanizing rubber by heating with sulfur in the presence of a product obtained by reacting a cyclohexylamine containing at least one hydrogen atom on the amino nitrogen atom with an aldehyde in the ratio of substantially two molecular proportions of amine and one of aldehyde and further reacting the product so obtained with carbon disulfide. No. 398,152. Monsanto Chemical Company. (Robert L. Sibley).

Making light weight refractory insulating brick by mixing the batch material of clay with 1-50% shredded or comminuted paper, tempering the batch in a wet state to produce a knurly and fibrous structure, molding the patch to the desired shape, and subjecting it to a firing temperature in a kiln to burn out the paper. No. 398,156. National Fire Proofing Company of Canada, Ltd. (Clarence S. Matheny).

Insulating cell of cellulosic material particularly suitable for use in conjunction with refrigerators. No. 398,158. Paper Patents Company. (Charles A. Fourness and Kenneth J. Harwood).

Process for the production of synthetic fibres which comprises forcing a solution of a polymerizable product of butadiene containing less than 20% polymer through a suitable spinning-nozzle vertically into a liquid consisting of at least a substantial proportion of a lower aliphatic alcohol, drawing the coagulated thread from said liquid at a rate exceeding the spinning rate, and immediately passing the coagulated thread through a liquid bath consisting of at least a substantial proportion of an organo-hydroxy compound held at a hardening temperature above about 80°C., whereby a completely coagulated and at least partially hardened fibre is produced which may be further treated. No. 398,168. Shell Development Company. (Hein I. Waterman and Willem L. J. de Nie).

Recovery of organic compound in a continuous flash distillation process for the recovery of ethylene glycol from an aqueous solution containing ethylene glycol and a dissolved salt. No. 398,169. Shell Development Company. (Jan D. Ruys).

Process of separating thiophenols from an alkyl phenol mixture containing the same. No. 398,170. Shell Development Company. (Daniel B. Luten, Jr.)

Process of desulfurizing alkyl phenols containing thiophenols. No. 398,171. Shell Development Company. (Harold I. Lounsbury).

Process for the production of ethylene sulfide by reacting 1-chloroethane-thiol-2 with an agent capable of binding hydrogen halide. No. 398,172. Shell Development Company. (Willem Coltof).

Parasitide containing as an active principle the product formed upon combining an organic thiocyanate with a compound selected from the group consisting of halogenated aliphatic ethers in which the carbon atoms directly attached to the ether-forming atom are devoid of other negative substituents and amines in which at least one of the N-substituents is a radical of negative character. No. 398,174. Shell Petroleum Corporation. (Homer E. Whitmire).

Process for combining paper and comparatively open mesh fabric to form a laminated product having a bonding film between the individual cloth fibers and the paper surface of relatively great strength and having low shrinkage characteristics on drying. No. 398,176. Stein, Hall Manufacturing Company, Inc. (Jordan V. Bauer and Don M. Hawley).

Process for the production of N-methyl sulfurous acid salts or N-methane sulfinic acid salts of 1-aryl-2.3-dialkyl-alkyl-aminopyrazolones. No. 398,188. Winthrop Chemical Company, Inc. (Max Bockmuhl, Walter Krohs, Fritz Racke and Kurt Windisch).

A combined fire detector, alarm and extinguisher. No. 398,190. (Emile Cambron).

Recovering yellow phosphorus from phosphorus sludge containing water which comprises heating such sludge in a closed vessel under a pressure below atmospheric so as to cause evaporation of water, until all the water has evaporated. No. 398,201. I. G. Farbenindustrie A. G. (Friedbert Ritter and Franz Rodis).

Production of 2-keto-sugar acids from their corresponding osones by electrolytic oxidation of the osone in aqueous solution, by means of bromine generated electrolytically in the solution from alkaline earth metal bromide, and in the presence of alkaline earth metal carbonates. No. 398,202. Merck & Co., Inc. (Elmer W. Cook).

Process of producing acetylated 2-keto-sugar acids from fully acetylated sugar acids. No. 398,203. Merck & Co., Inc. (Elmer W. Cook and Randolph T. Major).

Processes for the production of fully acetylated sugar acids from corresponding aldehydo sugar acetates and corresponding gamma lactones. No. 398,204. Merck & Co., Inc. (Randolph T. Major and Elmer W. Cook).

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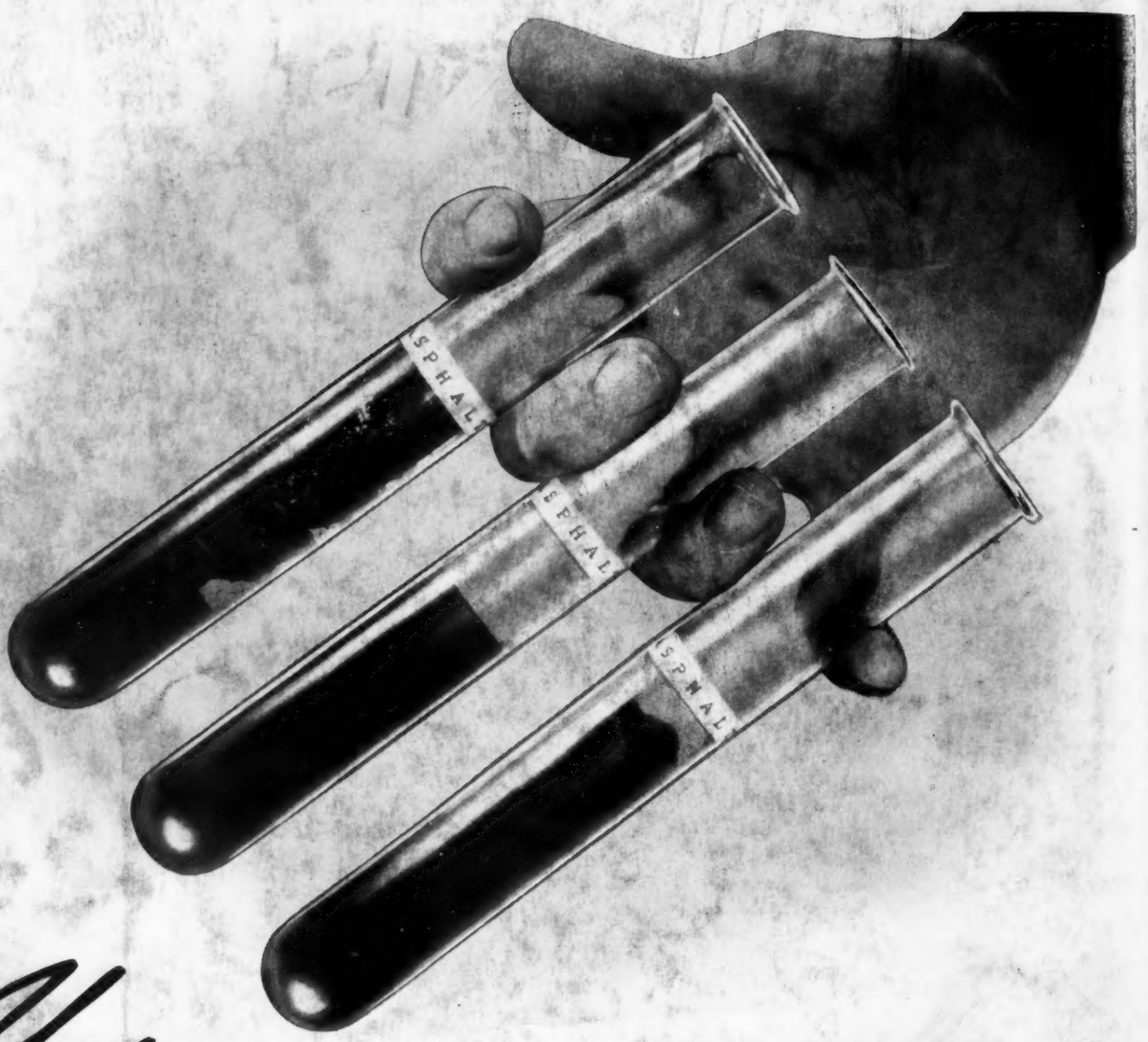

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